Final

Site Investigation Report
Directorate of Engineering and Housing (DEH) Compound, Parcels 64(7) and 1(7)

Fort McClellan
Calhoun County, Alabama

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Executive Summary

In accordance with Contract Number DACA21-96-D-0018, Task Order CK05, IT Corporation completed a site investigation (SI) at the Directorate of Engineering and Housing (DEH) Compound, Parcels 64(7) and 1(7), at Fort McClellan in Calhoun County, Alabama. The SI was conducted to determine whether chemical constituents are present at the site and, if present, whether the concentrations would present an unacceptable risk to human health or the environment. The SI at the DEH Compound, Parcels 64(7) and 1(7), consisted of the sampling and analyses of eight surface soil samples, one depositional soil sample, fifteen subsurface soil samples, eighteen groundwater samples, and six surface water and sediment samples. In addition, fourteen temporary groundwater monitoring wells were installed in the residuum groundwater zone to facilitate groundwater sample collection and to provide site-specific geological and hydrogeological characterization information.

Chemical analyses of samples collected at the DEH Compound, Parcels 64(7) and 1(7), indicate that metals, volatile organic compounds (VOC), semivolatile organic compounds (SVOC), pesticides/herbicides, and dioxins were detected in the various site media. To evaluate whether detected constituents pose an unacceptable risk to human health or the environment, analytical results were compared to human health site-specific screening levels (SSSL), ecological screening values (ESV), and background screening values for Fort McClellan.

The potential threat to human receptors is expected to be low. Although the site is projected for active recreational use, the soils and groundwater analytical data were screened against residential human health SSSLs to evaluate the site for possible unrestricted future land use.

In soils, with the exception of barium in one depositional soil sample, the metals concentrations that exceeded SSSLs were below their respective background concentration or within the range of background values. Three polynuclear aromatic hydrocarbons (PAH) compounds were detected at one surface soil location at concentrations exceeding SSSLs and PAH background values. However, these PAH compounds are believed to be related to anthropogenic activities (i.e., asphalt pavement) and not related to operations conducted at the site. The concentrations of two pesticides exceeded SSSLs at one surface soil location. Low levels of dioxins were detected in the two surface soil samples that were analyzed for these compounds. The concentrations of two dioxin compounds exceeded SSSLs in both surface soil samples. Based on the low concentrations and limited spatial distribution at the site, the pesticides and dioxins are not expected to pose a threat to human health.

In groundwater, several metals were detected at concentrations exceeding SSSLs and background concentrations. However, the majority of these metals were detected in groundwater samples with high turbidity at the time of sample collection, causing the elevated metals results. Vinyl chloride was detected in two groundwater samples at concentrations exceeding the SSSL. However, the vinyl chloride concentrations were below the U.S. Environmental Protection Agency drinking water standard, and vinyl chloride was not detected in any other wells at Parcel 64(7) or in surface water samples collected from Cane Creek, which is hydraulically downgradient of the wells with the vinyl chloride detections. The extent of the vinyl chloride contamination is defined horizontally and, given the low concentrations detected, is not expected to pose a threat to human health.

Metals, SVOCs, and pesticides were detected in site media at concentrations exceeding ESVs. However, the potential impact to ecological receptors is expected to be minimal based on existing habitat and site conditions. The site, located within the developed portion of the Main Post, consists of buildings and paved roads/areas interspersed with limited grassy and wooded areas. Viable ecological habitat is presently limited and is not expected to increase in the proposed land-use scenario. Consequently, the potential threat to ecological receptors is expected to be low.

Based on the results of the SI, past operations at the DEH Compound, Parcels 64(7) and 1(7), do not appear to have adversely impacted the environment. The metals and chemical constituents detected in site media do not pose an unacceptable risk to human health and the environment. Therefore, IT Corporation recommends “No Further Action” and unrestricted land reuse at the DEH Compound, Parcels 64(7) and 1(7).

1.0 Introduction

The U.S. Army has selected Fort McClellan (FTMC) located in Calhoun County, Alabama, for closure by the Base Realignment and Closure (BRAC) Commission under Public Laws 100-526 and 101-510. The 1990 Base Closure Act, Public Law 101-510, established the process by which U.S. Department of Defense (DOD) installations would be closed or realigned. The BRAC Environmental Restoration Program requires investigation and cleanup of federal properties prior to transfer to the public domain. The U.S. Army is conducting environmental studies of the impact of suspected contaminants at parcels at FTMC under the management of the U.S. Army Corps of Engineers (USACE)-Mobile District. The USACE contracted with IT Corporation (IT) to perform the site investigation (SI) at the Directorate of Engineering and Housing (DEH) Compound, Parcels 64(7) and 1(7), under Contract Number DACA21-96-D-0018, Task Order CK05.

This SI report presents specific information and results compiled from the SI, including field sampling and analysis, and monitoring well installation activities conducted at the DEH Compound, Parcels 64(7) and 1(7).

1.1 Project Description

The DEH Compound was identified as an area to be investigated prior to property transfer. The site was classified as a Category 7 site in the environmental baseline survey (EBS) (Environmental Science and Engineering, Inc. [ESE], 1998). Category 7 sites are areas that are not evaluated and/or that require further evaluation.

A site-specific field sampling plan (SFSP) attachment (IT, 1998a) and a site-specific safety and health plan (SSHP) attachment were finalized in October 1998. The SFSP and SSHP were prepared to provide technical guidance for sample collection and analysis at the DEH Compound, Parcels 64(7) and 1(7). The SFSP was used in conjunction with the SSHP as attachments to the installation-wide work plan (IT, 1998b) and the installation-wide sampling and analysis plan (SAP) (IT, 2000a). The SAP includes the installation-wide safety and health plan and quality assurance plan.

The SI included fieldwork to collect eight surface soil samples, one depositional soil sample, fifteen subsurface soil samples, eighteen groundwater samples, and six surface water and sediment samples to determine whether potential site-specific chemicals are present at the site, and to provide data useful for supporting any future corrective measures and closure activities.

1.2 Purpose and Objectives

The SI program was designed to collect data from site media and provide a level of defensible data and information in sufficient detail to determine whether chemical constituents are present at the DEH Compound, Parcels 64(7) and 1(7), at concentrations that would present an unacceptable risk to human health or the environment. The conclusions of the SI in Chapter 6.0 are based on the comparison of the analytical results to human health site-specific screening levels (SSSL), ecological screening values (ESV), and background screening values for FTMC. The SSSLs and ESVs were developed by IT as part of the human health and ecological risk evaluations associated with SIs being performed under the BRAC Environmental Restoration Program at FTMC. The SSSLs, ESVs, and polynuclear aromatic hydrocarbon (PAH) background screening values are presented in the *Final Human Health and Ecological Screening Values and PAH Background Summary Report* (IT, 2000b). The PAH background screening values were developed by IT at the direction of the BRAC Cleanup Team to address the occurrence of PAH compounds in surface soils as a result of anthropogenic activities at FTMC. Background metals screening values are presented in the *Final Background Metals Survey Report, Fort McClellan, Alabama* (Science Applications International Corporation [SAIC], 1998).

Based on the conclusions presented in this SI report, the BRAC Cleanup Team will decide to propose "No Further Action" at the site or to conduct additional work at the site.

1.3 Site Description and History

The DEH Compound is located in the northwestern portion of the Main Post of FTMC and is bounded by 6th Avenue to the northeast, Howlee Road to the southwest, 10th Street to the northwest, and 15th Street to the southeast (Figures 1-1 and 1-2). The study area covers approximately 10 acres. Cane Creek is located adjacent to Howlee Road just southwest of the DEH Compound and flows to the northwest. Manmade surface drainages bound the site to the northwest and southeast. At the time of SI field activities, the DEH Compound consisted of five sites, as described in the following paragraphs. However, historical operations at the DEH Compound ceased in September 1999 with Base closure, and the area is currently used by FTMC Transition Force personnel.

Former PCP Dip Tank (Parcel 64[7]). The former pentachlorophenol (PCP) dip tank (Parcel 64[7]) was located in the west-central section of the DEH Compound (Figure 1-2). The 2,500-gallon dip tank, installed in the mid-1960s, was constructed of steel with two doors located at the top of the tank, approximately level with the ground surface. The dip tank was used to store water, diesel fuel, and PCP, which is a hazardous waste. Dipping operations at this site ceased in 1981 (ESE, 1998). The tank was removed and properly disposed in October 1987.

Washrack, Building 214 (Parcel 64[7]). The DEH Washrack (Parcel 64[7]) was located at Building 214 in the northwestern portion of the DEH Compound, inside the chain-link fence and next to the vehicle washrack (Figure 1-2). The Washrack was built in 1965 and had a baffle-type oil/water separator (OWS) that was reportedly inoperable. Consequently, the bypass valve was closed off permanently. This system historically discharged directly into storm water drainage. The Washrack facility was rebuilt in 1991 with a settling basin attached to a coalescing plate OWS. The new OWS system, located across a man-made drainage feature from the Washrack area, discharged into the sanitary sewer system. The OWS and Washrack were connected via an underground, 6-inch Schedule 80 polyvinyl chloride (PVC) pipeline, which was partially exposed at ground surface at the drainage ditch area.

Former Pesticide and Herbicide Storage Facility, Building 208 (Parcel 64[7]). The former pesticide and herbicide storage facility was located in Building 208, inside the chain-link fence in the northern section of the DEH Compound (Figure 1-2). The facility was constructed in 1957 for use as a vehicle storage area. However, the facility was used for pesticide and herbicide storage from 1971 to 1986. Mixing of pesticides reportedly occurred at the job site and not on the pavement in front of Building 208 (ESE, 1998). Spills or releases have not been documented at Building 208, and evidence of spillage or stressed vegetation was not observed during the site visit. In 1986, pesticide operations were relocated to Building 211. The tire repair shop later occupied the portion of Building 208 where the former pesticide and herbicide storage facility was located.

Pesticide and Herbicide Mixing and Storage Facility, Building 211 (Parcel 64[7]). The pesticide mixing and storage facility was located in Building 211 in the northwest part of the DEH Compound (Figure 1-2). The building was designed and constructed in 1960 specifically for storing and mixing pesticides; operations began that same year. Building 211 included a mix-rinse area inside the building for small quantity mixing (hand-held pump sprayers) and a covered mix-rinse pad, used by tractor-mounted sprayers. The building was originally equipped with a sump to collect rinse water from the covered mix-rinse pad for subsequent carbon filtration. This water was to be discharged to the sanitary sewer system (Roy F. Weston, 1990); however, the waste handling system was believed to be performing poorly, therefore the floor drain was filled with cement, and the mix-rinse pad is no longer used (ESE, 1998).

The quantity of pesticides stored in Building 211 normally reflected the expected application requirements for pest control in various buildings, including mess halls and housing facilities. The storage area was temperature-controlled and had an impermeable floor and secondary containment within the building. Pesticides historically stored in this building include Dursban, Xtrban Roach Concentrate, Diazinon 4E, Sevin, Malathion, Killmaster II, and Prohibit Insecticide. Chemicals currently stored in Building 211 include Dursban LO, Roundup, Orthene, 2,4-Dichlorophenoxyacetic acid (2,4-D), and Award (ESE, 1998).

Building 202/215 Administrative/General Purpose Engineering Housing Management (Parcel 1[7]). Building 202/215 (Parcel 1[7]) is located in the central and southeastern part of the DEH Compound (Figure 1-2). Building 215 was constructed in 1955 as a general purpose/administrative building. Building 202 was added in 1957. The complex formerly housed the building materials storage, painting shop, lawn mower shop, wood shop, refrigeration shop, fog oil storage, engineering warehouse, welding shop, an electrical building, and the Department of Housing and Engineering.

At the time of SI field activities, the area around the DEH Compound consisted of housing, recreational, training, and administrative buildings. The site is located on a nearly flat broad crest, approximately 740 feet above sea level. The site is approximately 500 feet wide (northeast to southwest) by 900 feet long (northwest to southeast), and is bounded on all sides by a chain-link fence.

2.0 Previous Investigations

An EBS was conducted by ESE to document current environmental conditions of all FTMC property (ESE, 1998). The study was to identify sites that, based on available information, have no history of contamination and comply with DOD guidance for fast-track cleanup at closing installations. The EBS also provides a baseline picture of FTMC properties by identifying and categorizing the properties by seven criteria:

1. Areas where no storage, release, or disposal of hazardous substance or petroleum products has occurred (including no migration of these substances from adjacent areas)

2. Areas where only release or disposal of petroleum products has occurred

3. Areas where release, disposal, and/or migration of hazardous substances has occurred, but at concentrations that do not require a removal or remedial response

4. Areas where release, disposal, and/or migration of hazardous substances has occurred, and all removal or remedial actions to protect human health and the environment have been taken

5. Areas where release, disposal, and/or migration of hazardous substances has occurred, and removal or remedial actions are underway, but all required remedial actions have not yet been taken

6. Areas where release, disposal, and/or migration of hazardous substances has occurred, but required actions have not yet been implemented

7. Areas that are not evaluated or require additional evaluation.

The EBS was conducted in accordance with the Community Environmental Response Facilitation Act (CERFA) (CERFA-Public Law 102-426) protocols and DOD policy regarding contamination assessment. Record searches and reviews were performed on all reasonably available documents from FTMC, the Alabama Department of Environmental Management (ADEM), the U.S. Environmental Protection Agency (EPA) Region IV, and Calhoun County, as well as a database search of Comprehensive Environmental Response, Compensation, and Liability Act-regulated substances, petroleum products, and Resource Conservation and Recovery Act-regulated facilities. Available historic maps and aerial photographs were reviewed to document historic land uses. Personal and telephone interviews of past and present FTMC employees and military personnel were conducted. In addition, visual site inspections were conducted to verify conditions of specific property parcels. Previous investigations have been conducted at the DEH Compound as described in the following paragraphs.

Former PCP Dip Tank (Parcel 64[7]). In May 1986, the contents of the PCP Dip Tank were pumped into 55-gallon drums, and the tank was cleaned. The tank later filled with rainwater. This rainwater was sampled and the results indicated that the contents were nonhazardous. Because the rainwater was nonhazardous, it was discharged to the sanitary sewer. A surface soil sample was also collected from the immediate area around the tank and found to be nonhazardous as well (ESE, 1998). The U.S. Army Environmental Hygiene Agency indicated that inspection of the tank prior to cleaning revealed that it had probably leaked in the past.

The PCP Dip Tank was removed for proper disposal in October 1987. A record of further sampling was not documented in the report. The concrete slab was demolished, and the rubble and surrounding soil were removed with a backhoe. Soil samples were collected and analyzed; these samples were nonhazardous. The excavation was backfilled with clean soil. Groundwater samples were not collected in this area (ESE, 1998). Analytical results from previous sampling activities at the former PCP Dip Tank have not been found.

Pesticide Mixing/Storage Facility, Building 211 (Parcel 64[7]). In 1985, soil samples were collected at this facility and analyzed for pesticides and other semivolatile compounds. The results indicated trace concentrations of chlordane metabolites, methoxychlor, hexachlorobenzene, dichlorodiphenyltrichloroethane (DDT), and dieldrin (Table 2-1). The concentrations of these chemicals were determined not to exceed levels that would be harmful to human health and the environment. Because of the long history of the facility, it was determined that additional investigation was needed at this site (ESE, 1998).

Building 202/215 (Parcel 1[7]). In 1982, a 2,000-gallon steel underground storage tank (UST) was installed at the site to store waste oil. The 2,000-gallon UST was located next to Building 205, approximately 50 feet south of Building 202 (Figure 2-1). On April 26, 1994, three soil borings (215-E, 215-S, and 215-W) were advanced on the accessible sides of the 2,000-gallon steel UST using a hollow-stem auger rig. Soil samples were collected at two intervals (7.5 feet below ground surface [bgs] and 10 feet bgs) from borings 215-S and 215-W. One soil sample was collected at soil boring location 215-E at 10 feet bgs. Soil samples from each boring were analyzed for total petroleum hydrocarbons (TPH) and lead. TPH was detected at

Table 2-1

Summary of 1985 Soil Sample Analytical Results
Herbicide/Pesticide Mixing Area, Building 211
DEH Compound, Parcels 64(7) and 1(7)
Fort McClellan, Calhoun County, Alabama

Constituent	Detection Level (ppm)	Sample Number 008 (ppm)	009 (ppm)
beta-BHC	0.010	*	*
delta-BHC	0.010	*	*
Lindane	0.004	ND	ND
O,P'-DDD	0.020	*	*
P,P'-DDD	0.016	*	*
P,P'-DDE	0.016	*	*
O,P'-DDE	0.020	*	*
O,P'-DDT	0.020	*	*
P,P'-DDT	0.030	1.75	1.02
Aldrin	0.021	*	*
Dieldrin	0.012	0.32	0.13
Endrin	0.021	ND	ND
Chlordane	0.060	ND	ND
Metabolized chlordane/ total constituents	0.060	19	5.02
Heptachlor	0.003	+	ND
Heptachlor epoxide	0.008	*	*
cis-Chlordane	0.008	+	+
trans-Chlordane	0.008	+	+
Oxychlordane	0.008	*	*
Methoxychlor	0.08	0	1.16
Mirex	0.020	ND	ND
Toxaphene	0.800	ND	ND
PCB-1242	0.200	*	*
PCB-1246	0.200	*	*
PCB-1254	0.200	*	*
PCB-1260	0.200	ND	ND
Chlorpyrifos	0.200	ND	ND
Ronnel	0.010	ND	ND
Diazinon	0.052	ND	ND
Methyl parathion	0.03	ND	ND
Parathion	0.020	ND	ND
Malathion	0.010	ND	ND
2,4-D (as methyl ester)	0.010	**	**
2,4,5-T (as methyl ester)	0.004	**	**
Silvex (as methyl ester)	0.004	**	**
Hexachlorobenzene	0.003	ND	0.03

Source: Roy F. Weston, Inc., 1990, *Enhanced Preliminary Assessment, Fort McClellan, Alabama*.
ND - Not detected.
ppm - Parts per million.
* Unable to effect separation of any low levels of this compound due to the high levels of chlordane constituents.
** Not screened for in this sample. Unable to overcome high buffering capacity of the soil using present methods.
+ Included in metabolized chlordane/total constituents.

concentrations of 3,700 milligrams per kilogram (mg/kg) and 2,500 mg/kg in the soil samples collected at 7.5 feet bgs in the south (sample 215-S) and west (sample 215-W) sides, respectively, of the tank excavation. The borings were advanced to approximately 10 to 13.5 feet bgs. Weathered shale bedrock was encountered at approximately 7 to 8 feet bgs in each boring. Soil sample analytical results are presented in Table 2-2. Soil boring locations with TPH and lead concentrations are shown on Figure 2-2.

On May 13, 1994, the 2,000-gallon steel UST was closed in place and filled with concrete slurry. A new 2,500-gallon fiberglass UST was later installed approximately 30 feet south to replace the steel 2,000-gallon UST (Figure 2-1).

On May 18, 1994, four monitoring wells (MW-1, MW-2, MW-3, and MW-4) were installed at the site. Monitoring wells MW-1, MW-2, and MW-3 were installed adjacent to soil boring locations 215-E, 215-S, and 215-W, respectively. MW-4 was installed near the southwest corner of Building 205 (Figure 2-1). The monitoring wells were advanced to 17 feet bgs. Groundwater samples were collected from each of the four monitoring wells on October 14, 1994 and analyzed for volatile organic compounds (VOC), total lead, and PAHs. VOCs, PAHs, and lead were not detected in the four monitoring wells, except for fluorene in MW-2, MW-3, and MW-4, and benzo(k)fluoranthene in MW-4. Groundwater depths in 1994 ranged from approximately 5 to 8 feet bgs based on groundwater data from each monitoring well. The closure report concluded that a petroleum release had occurred on site, and that the vertical and horizontal extent of contamination in the soil had not been determined (Braun Intertec Corporation, 1995).

Table 2-2

Summary of 1994 Soil Sample Analytical Results
Waste Oil UST at Building 202/215
DEH Compound, Parcels 64(7) and 1(7)
Fort McClellan, Calhoun County, Alabama

Soil Sample Boring Location	Depth (feet bgs)	TPH Concentration (mg/kg)	Total Lead Concentration (mg/kg)
215-E	10	10	20
215-S	7.5	3,700	12
215-S	10	25	20
215-W	7.5	2,500	11
215-W	10	5	18

Source: Braun Intertec Corporation, 1995, *UST Closure, Site Assessment Report, Building 215, Fort McClellan, Calhoun County, Alabama*.

bgs - Below ground surface.
mg/kg - Milligrams per kilogram.
TPH - Total petroleum hydrocarbons.
UST - Underground storage tank.

3.0 Current Site Investigation Activities

This chapter summarizes SI activities conducted by IT at the DEH Compound, Parcels 64(7) and 1(7), including environmental sampling and analysis, and groundwater monitoring well installation activities.

3.1 Environmental Sampling

The environmental sampling performed during the SI at the DEH Compound, Parcels 64(7) and 1(7), included the collection of surface and depositional soil samples, subsurface soil samples, groundwater samples, and surface water and sediment samples for chemical and physical analyses. The sample locations were determined by observing site physical characteristics noted during a site walkover and by reviewing historical documents pertaining to activities conducted at the site. The sample locations, media, and rationale are summarized in Table 3-1. Sampling locations are shown on Figure 3-1. Samples were submitted for laboratory analyses of site-related parameters listed in Section 3.3.

3.1.1 Surface and Depositional Soil Sampling

Surface soil samples were collected from eight locations and a depositional soil sample was collected from one location at the DEH Compound, Parcels 64(7) and 1(7), as shown on Figure 3-1. Soil sampling locations and rationale are presented in Table 3-1. Sample designations and quality assurance/quality control (QA/QC) samples are listed in Table 3-2. Soil sampling locations were determined in the field by the on-site geologist based sampling rationale, presence of surface structures, site topography, and buried utilities.

Sample Collection. Surface and depositional soil samples were collected from the upper 1 foot of soil with a 3-inch diameter stainless-steel hand auger using the methodology specified in Section 4.9.1.1 of the SAP (IT, 2000a). Surface and depositional soil samples were collected by first removing surface debris, such as fill material or vegetation, from the immediate sample area. The soil was then collected with the sampling device and screened with a photoionization detector (PID) in accordance with Section 4.7.1.1 of the SAP (IT, 2000a). Samples for VOC analyses were collected directly from the sampler using three EnCore® samplers. The remaining portion of the sample was transferred to a clean stainless-steel bowl, homogenized, and placed in the appropriate sample containers. The samples were analyzed for the parameters listed in Table 3-2 using methods outlined in Section 3.3. Sample collection logs are included in Appendix A.

Table 3-1

Sampling Locations and Rationale
DEH Compound, Parcels 64(7) and 1(7)
Fort McClellan, Calhoun County, Alabama

Sample Location	Sample Media	Sample Location Rationale
FTA-64-GP01	Surface Soil Subsurface Soil Groundwater	Surface soil, subsurface soil, and groundwater samples were collected near the site of the removed 2,500-gallon pentachlorophenol (PCP) dip tank.
FTA-64-GP02	Surface Soil Subsurface Soil Groundwater	Surface soil, subsurface soil, and groundwater samples were collected near the site of the removed 2,500-gallon PCP dip tank.
FTA-64-GP03	Subsurface Soil Groundwater	Subsurface soil and groundwater samples were collected from the washrack area at Building 214.
FTA-64-GP04	Subsurface Soil Groundwater	Subsurface soil and groundwater samples were collected between the drainage ditch and the oil/water separator.
FTA-64-GP05	Surface Soil Subsurface Soil	Surface soil and subsurface soil samples were collected on the southwest side of Building 211 (pesticide/herbicide storage area).
FTA-64-GP06	Surface Soil Subsurface Soil Groundwater	Surface soil, subsurface soil, and groundwater samples were collected near the southwest corner of Building 208.
FTA-64-GP07	Surface Soil Subsurface Soil Groundwater	Surface soil, subsurface soil, and groundwater samples were collected outside the chain-link fence adjacent to Building T-213.
FTA-64-GP08	Surface Soil Subsurface Soil Groundwater	Surface soil, subsurface soil, and groundwater samples were collected outside the chain-link fence adjacent to Building 205.
FTA-64-GP09	Subsurface Soil Groundwater	Subsurface soil and groundwater samples were collected outside the chain-link fence adjacent to the drum storage area.
FTA-64-GP10	Subsurface Soil Groundwater	Subsurface soil and groundwater samples were collected from an upgradient location in the grassy area approximately 80 feet east of Building 215.
FTA-64-GP11	Subsurface Soil Groundwater	Subsurface soil and groundwater samples were collected from an upgradient location near the drainage ditch outside the chain-link fence.
FTA-64-GP12	Subsurface Soil Groundwater	Subsurface soil and groundwater samples were collected adjacent to Building 217 approximately 30 feet north of Building 208. Visible evidence of oil staining on the concrete flooring was noted during the site walkover in April 1998.
FTA-64-GP13	Subsurface Soil Groundwater	Subsurface soil and groundwater samples were collected adjacent to Building 209.
FTA-64-GP14	Surface Soil Subsurface Soil Groundwater	Surface soil, subsurface soil, and groundwater samples were collected between Building T-213 and Cane Creek.
FTA-64-GP15(SS) FTA-64-GP15(W)	Surface Soil Subsurface Soil Groundwater	Surface soil, subsurface soil, and groundwater samples were collected near the door of Building 211.
FTA-64-MW01	Groundwater	A groundwater sample was collected from existing monitoring well MW-1 near the abandoned underground storage tank (UST) location adjacent to Building 205.

Table 3-1

Sampling Locations and Rationale
DEH Compound, Parcels 64(7) and 1(7)
Fort McClellan, Calhoun County, Alabama

Sample Location	Sample Media	Sample Location Rationale
FTA-64-MW02	Groundwater	A groundwater sample was collected from existing monitoring well MW-2 near the abandoned UST location adjacent to Building 205.
FTA-64-MW03	Groundwater	A groundwater sample was collected from existing monitoring well MW-3 near the abandoned UST location adjacent to Building 205.
FTA-64-MW04	Groundwater	A groundwater sample was collected from existing monitoring well MW-4 near the abandoned UST location adjacent to Building 205.
FTA-64-SW/SD01	Surface Water Sediment	Surface water and sediment samples were collected in the marsh area adjacent to Howlee Road in the western section of the DEH Compound.
FTA-64-SW/SD02	Surface Water Sediment	Surface water and sediment samples were collected from the drainage ditch next to Building 217, just north of Building 208. Soil staining was observed during site walkovers in April 1998.
FTA-64-SW/SD03	Surface Water Sediment	Surface water and sediment samples were collected from an upgradient location in the drainage ditch northeast of Building 217.
FTA-64-DEP02	Depositional Soil	A depositional soil sample was collected near the confluence of the drainage ditch located behind Building 208.
FTA-151-SW/SD01	Surface Water Sediment	Surface water and sediment samples were collected from Cane Creek at the north end of adjacent Parcel 151 from a location hydraulically downgradient from the DEH Compound.
FTA-151-SW/SD02	Surface Water Sediment	Surface water and sediment samples were collected from Cane Creek northeast of Building T-257 (at adjacent Parcel 151) from a location hydraulically downgradient from the DEH Compound.
FTA-151-SW/SD03	Surface Water Sediment	Surface water and sediment samples were collected from Cane Creek directly east of Building T-258 (at adjacent Parcel 151) from a location hydraulically downgradient from the DEH Compound.

Table 3-2

Surface, Subsurface, and Depositional Soil Sample Designations and QA/QC Samples
DEH Compound, Parcels 64(7) and 1(7)
Fort McClellan, Calhoun County, Alabama

Sample Location	Sample Designation	Sample Depth (ft. bgs)	QA/QC Samples: Field Duplicates	QA/QC Samples: Field Splits	QA/QC Samples: MS/MSD	Analytical Suite
FTA-64-GP01	FTA-64-GP01-SS-EA0001-REG FTA-64-GP01-DS-EA0002-REG	0-1 9-12				TCL VOCs, TCL SVOCs, Dioxins, TAL Metals
FTA-64-GP02	FTA-64-GP02-SS-EA0003-REG FTA-64-GP02-DS-EA0004-REG	0-1 9-12				TCL VOCs, TCL SVOCs, Dioxins, TAL Metals
FTA-64-GP03	FTA-64-GP03-DS-EA0005-REG	8-11	FTA-64-GP03-DS-EA0006-FD	FTA-64-GP03-DS-EA0007-FS		TCL VOCs, TCL SVOCs, TAL Metals
FTA-64-GP04	FTA-64-GP04-DS-EA0008-REG	1-4				TCL VOCs, TCL SVOCs, TAL Metals
FTA-64-GP05	FTA-64-GP05-SS-EA0009-REG FTA-64-GP05-DS-EA0011-REG	0-1 8-12	FTA-64-GP05-SS-EA1010-FD			TCL VOCs, TCL SVOCs, TAL Metals Cl. Pesticides/herbicides, OP Pesticides
FTA-64-GP06	FTA-64-GP06-SS-EA0012-REG FTA-64-GP06-DS-EA0013-REG	0-1 5-9			FTA-64-GP06-DS-EA0013-MS[a] FTA-64-GP06-DS-EA0013-MSD[b]	TCL VOCs, TCL SVOCs, TAL Metals Cl. Pesticides/herbicides, OP Pesticides
FTA-64-GP07	FTA-64-GP07-SS-EA0014-REG FTA-64-GP07-DS-EA0015-REG	0-1 8-12				TCL VOCs, TCL SVOCs, TAL Metals Cl. Pesticides/herbicides, OP Pesticides
FTA-64-GP08	FTA-64-GP08-SS-EA0016-REG FTA-64-GP08-DS-EA0017-REG	0-1 5-9				TCL VOCs, TCL SVOCs, TAL Metals Cl. Pesticides/herbicides, OP Pesticides
FTA-64-GP09	FTA-64-GP09-DS-EA0018-REG	5-9				TCL VOCs, TCL SVOCs, TAL Metals Cl. Pesticides/herbicides, OP Pesticides
FTA-64-GP10	FTA-64-GP10-DS-EA0019-REG	5-7				TCL VOCs, TCL SVOCs, TAL Metals
FTA-64-GP11	FTA-64-GP11-DS-EA0020-REG	4-8				TCL VOCs, TCL SVOCs, TAL Metals
FTA-64-GP12	FTA-64-GP12-DS-EA0021-REG	4-8				TCL VOCs, TCL SVOCs, TAL Metals Cl. Pesticides/herbicides, OP Pesticides
FTA-64-GP13	FTA-64-GP13-DS-EA0022-REG	4-8				TCL VOCs, TCL SVOCs, TAL Metals
FTA-64-GP14	FTA-64-GP14-SS-EA0023-REG FTA-64-GP14-DS-EA0024-REG	0-1 1-5				TCL VOCs, TCL SVOCs, TAL Metals Cl. Pesticides/herbicides, OP Pesticides
FTA-64-GP15(SS)	FTA-64-GP15-SS-EA0025-REG FTA-64-GP15-DS-EA0026-REG	0-1 8-12				TCL VOCs, TCL SVOCs, TAL Metals Cl. Pesticides/herbicides, OP Pesticides
FTA-64-DEP02	FTA-64-DEP02-DEP-EA0026-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals, PCBs, Cl. Pesticides/herbicides, OP Pesticides

[a] Analyzed for VOCs, SVOCs, metals, and Cl. Pesticides only.

[b] Analyzed for TCL VOCs only.

Cl. - Chlorinated.
FD - Field duplicate.
FS - Field split.
ft. bgs - Feet below ground surface.
MS/MSD - Matrix spike/matrix spike duplicate.
OP - Organophosphorus.
PCB - Polychlorinated biphenyl.
QA/QC - Quality assurance/quality control.
REG - Field sample.
SVOC - Semivolatile organic compound.
TAL - Target analyte list.
TCL - Target compound list.
VOC - Volatile organic compound.

3.1.2 Subsurface Soil Sampling

Subsurface soil samples were collected from 15 soil borings at the DEH Compound, Parcels 64(7) and 1(7). Subsurface soil sampling locations and rationale are presented in Table 3-1. Subsurface soil sample designations, depths, and QA/QC samples are listed in Table 3-2. Soil boring sampling locations were determined in the field by the on-site geologist based on sampling rationale, presence of surface structures, site topography, and buried and overhead utilities. IT contracted TEG, Inc., a direct-push technology subcontractor, to assist in subsurface soil sample collection.

Sample Collection. Subsurface soil samples were collected from soil borings at depths greater than 1 foot bgs in the unsaturated zone. The soil borings were advanced and soil samples collected using the direct-push sampling procedures specified in Section 4.9.1.1 of the SAP (IT, 2000a). Sample collection logs are included in Appendix A. The samples were analyzed for the parameters listed in Table 3-2 using methods outlined in Section 3.3.

Subsurface soil samples were collected continuously to 12 feet bgs or until direct-push sampler refusal was encountered. Samples were field screened using a PID in accordance with Section 4.7.1.1 of the SAP (IT, 2000a) to measure for volatile organic vapors. The soil sample displaying the highest reading was selected and sent to the laboratory for analysis; however, at those locations where PID readings were not greater than background, the deepest soil sample interval above the saturated zone was submitted for analyses. Samples to be analyzed for VOCs were collected directly from the sampler using three EnCore® samplers. The remaining portion of the sample was transferred to a clean stainless-steel bowl, homogenized, and placed in the appropriate sample containers. The samples were analyzed for the parameters listed in Table 3-2 using methods outlined in Section 3.3. The on-site geologist constructed a detailed boring log for each soil boring. The lithological log for each borehole is included in Appendix B.

At the completion of soil sampling, boreholes were abandoned with bentonite pellets and hydrated with potable water following borehole abandonment procedures summarized in Appendix B of the SAP (IT, 2000a).

3.1.3 Well Installation

Fourteen temporary wells were installed in the residuum groundwater zone at the DEH Compound, Parcels 64(7) and 1(7), to collect groundwater samples for laboratory analyses. The well/groundwater sample locations are shown on Figure 3-1. Table 3-3 summarizes construction details of the temporary wells installed at the site. The well construction logs are included in Appendix B.

Initially, four of the temporary wells (FTA-64-GP01, FTA-64-GP03, FTA-64-GP07, and FTA-64-GP09) were installed by TEG using direct-push technology. However, three of the direct-push wells (FTA-64-GP01, FTA-64-GP03, and FTA-64-GP09) did not produce enough groundwater to collect the required sample volume. Therefore, at these locations, IT installed temporary wells using hollow-stem augers to produce sufficient water for groundwater sampling. The direct-push temporary wells were installed by advancing a 2-inch outside diameter direct-push sampler to 12 feet bgs or until direct-push sampler refusal was encountered. The direct-push sampler was removed from the borehole and a 5-foot length of 1-inch inside diameter (ID), 0.010-inch, factory-slotted Schedule 40 PVC screen with a 1-inch PVC end cap was placed at the bottom of the borehole and attached to 1-inch ID, flush-threaded Schedule 40 PVC riser. A number 1 filter sand (environmentally safe, clean fine sand, sieve size 20 to 40) was placed in the annular space of the borehole around the screen from the bottom of the borehole to approximately 1 foot above the top of the screen. A seal was created from the top of the filter sand to the ground surface by placing bentonite chips in the annular space and hydrating with potable water. Following groundwater sampling, the direct-push temporary wells were abandoned by removing the PVC riser and screen from the borehole and adding bentonite chips to ground surface and hydrating with potable water. Well abandonment procedures followed guidelines outlined in Appendix C of the SAP (IT, 2000a).

IT contracted Miller Drilling, Inc., to install the remaining temporary wells using a hollow-stem auger rig at the locations shown on Figure 3-1. IT attempted to install the temporary wells at the locations where direct-push soil samples were collected. However, at one location (FTA-64-GP15) this was not possible because of overhead and underground utilities. Consequently, the temporary well was installed approximately 25 feet southeast of the soil boring location. The soil sampling location was identified with “(SS)” and the associated temporary well location was identified with “(W)”. The wells were installed following procedures outlined in Section 4.7 and Appendix C of the SAP (IT, 2000a). The boreholes at these locations were advanced with a 4.25-inch ID hollow-stem auger from ground surface to the first water-bearing zone in residuum at the well location. The borehole was augered to the depth of direct-push sampler refusal, and samples were collected at the depth of direct-push refusal to the bottom of the borehole. A 2-foot-long, 2-inch ID carbon steel split-spoon sampler was driven at 5-foot intervals to collect residuum for observing and describing lithology. Where spoon refusal was encountered, the

Table 3-3

Temporary Well Construction Summary
DEH Compound, Parcels 64(7) and 1(7)
Fort McClellan, Calhoun County, Alabama

Temporary Well	Northing	Easting	Ground Elevation (ft msl)	TOC Elevation (ft msl)	Well Depth (ft bgs)	Screen Length (ft)	Screen Interval (ft bgs)	Well Material
FTA-64-GP01	1171470.78	668961.70	737.46	737.33	11	5	6 - 11	2" ID PVC Sch. 40
FTA-64-GP02	1171423.75	668937.58	736.81	737.70	23	15	7.75 - 22.75	2" ID PVC Sch. 40
FTA-64-GP03	1171684.48	668776.11	735.68	735.31	38	30	8 - 38	2" ID PVC Sch. 40
FTA-64-GP04	1171735.58	668732.36	733.61	734.43	24	10	13.75 - 23.75	2" ID PVC Sch. 40
FTA-64-GP06	1171697.87	669004.52	736.05	736.26	20	15	4.75 - 19.75	2" ID PVC Sch. 40
FTA-64-GP07*	1171481.59	668801.85	735.02	739.29	11	5	6 - 11	1" ID PVC Sch. 40
FTA-64-GP08	1171308.71	668975.56	736.57	737.67	33	10	22.75 - 32.75	2" ID PVC Sch. 40
FTA-64-GP09	1171167.80	669157.41	738.12	737.95	24	15	9 - 24	2" ID PVC Sch. 40
FTA-64-GP10	1171346.33	669561.14	742.11	744.60	22	15	6.75 - 21.75	2" ID PVC Sch. 40
FTA-64-GP11	1171576.18	669449.94	742.19	743.49	20	15	4.75 - 19.75	2" ID PVC Sch. 40
FTA-64-GP12	1171855.38	669048.70	739.13	740.09	18	10	7.75 - 17.75	2" ID PVC Sch. 40
FTA-64-GP13	1171684.11	669047.34	736.18	736.87	18	10	7.75 - 17.75	2" ID PVC Sch. 40
FTA-64-GP14	1171399.03	668829.79	735.23	736.35	19	10	8.75 - 18.75	2" ID PVC Sch. 40
FTA-64-GP15(W)	1171560.80	668869.81	739.37	738.64	24	15	8.75 - 23.75	2" ID PVC Sch. 40

Temporary wells installed using a hollow-stem auger, except as noted by *.
* Temporary well installed using direct-push technology.
Horizontal coordinates referenced to the U.S. State Plane Coordinate System, Alabama East Zone, North American Datum of 1983 (NAD83).
Elevations referenced to the North American Vertical Datum of 1988 (NAVD88).
1" ID Sch. 40 PVC - 1-inch inside diameter, Schedule 40, polyvinyl chloride.
2" ID Sch. 40 PVC - 2-inch inside diameter, Schedule 40, polyvinyl chloride.
bgs - Below ground surface.
ft - Feet.
msl - Mean sea level.
TOC - Top of casing.

auger was advanced until the first water-bearing zone was encountered. The on-site geologist logging the auger boreholes continued the lithological log for each borehole from the depth of split-spoon sampler refusal to the bottom of the auger borehole by logging the auger drill cuttings. The drill cuttings were logged to determine lithologic changes and the approximate depth of groundwater encountered during drilling. This information was used to determine the optimal placement of the monitoring well screen interval and to provide site-specific geologic and hydrogeologic information. The lithological log for each borehole is included in Appendix B.

Upon reaching the target depth at the hollow-stem auger wells, a 5- to 30-foot length of 2-inch ID, 0.010-inch factory slotted, Schedule 40 PVC screen with a 3-inch PVC end cap was placed through the auger to the bottom of the borehole. The screen and end cap were attached to 2-inch ID, flush-threaded Schedule 40 PVC riser. A sand pack consisting of number 1 filter sand was placed around the well screen to approximately 2 feet above the top of the well screen as the augers were removed. The wells were surged approximately 10 minutes using a solid PVC surge block, or until no more settling of the sand pack occurred inside the borehole. A bentonite seal, consisting of approximately 2 feet of bentonite pellets, was placed immediately on top of the sand pack and hydrated with potable water. If the bentonite seal was installed below the water table surface, the bentonite pellets were allowed to hydrate in the groundwater. Bentonite seal placement and hydration followed procedures in Appendix C of the SAP (IT, 2000a). At each of the temporary well locations except FTA-64-GP01, FTA-64-GP03, and FTA-64-GP09, the temporary well surface completion included attaching plastic sheeting around the PVC riser using duct tape. Additionally, sand bags were used to secure the sheeting to the ground surface around the temporary well. A locking well cap was placed on the PVC well casing.

At well locations FTA-64-GP01, FTA-64-GP03, and FTA-64-GP09, the wells were grouted to ground surface and a concrete pad was installed flush to ground surface. An 8-inch-diameter, traffic-bearing steel vault was placed around the well casing flush to the concrete surface pad. A locking well cap was placed on the PVC well casing.

The 2-inch diameter temporary wells that were installed using hollow-stem augers were developed by surging and pumping with a submersible pump in accordance with methodology outlined in Section 4.8 and Appendix C of the SAP (IT, 2000a). The submersible pump used for well development was moved in an up-and-down fashion to encourage any residual well installation materials to enter the well. These materials were then pumped out of the well in order to re-establish the natural hydraulic flow conditions. Development continued until the water turbidity was equal to or less than 20 nephelometric turbidity units (NTU) or for a maximum of 4 hours. The well development logs are included in Appendix C.

3.1.4 Water Level Measurements

The depth to groundwater was measured in temporary, permanent, and existing wells at FTMC in March 2000 following procedures outlined in Section 4.18 of the SAP (IT, 2000a). Depth to groundwater was measured with an electronic water level meter. The meter probe and cable were cleaned between use at each well following decontamination methodology presented in Section 4.10 of the SAP (IT, 2000a). Measurements were referenced to the top of the PVC casing. A summary of groundwater level measurements is presented in Table 3-4.

3.1.5 Groundwater Sampling

Groundwater samples were collected from fourteen temporary wells installed during the SI and from four existing wells at the DEH Compound, Parcels 64(7) and 1(7), at the locations shown on Figure 3-1. The groundwater sampling locations and rationale are listed in Table 3-1. The groundwater sample designations and QA/QC samples are listed in Table 3-5. For the purpose of the SI, existing monitoring wells MW-1, MW-2, MW-3, and MW-4 (Figure 2-1), were redesignated FTA-64-MW01, FTA-64-MW02, FTA-64-MW03, and FTA-64-MW04, respectively.

Sample Collection. Groundwater sampling was performed at the temporary and existing monitoring well locations following procedures outlined in Section 4.9 of the SAP (IT, 2000a). Groundwater was sampled after purging a minimum three well volumes and after field parameters (i.e., temperature, pH, specific conductivity, oxidation-reduction potential, and turbidity) stabilized. Purging and sampling were performed with a submersible and/or peristaltic pump equipped with Teflon™ tubing. Field parameters were measured using a calibrated water quality meter. Field parameter readings are summarized in Table 3-6. Sample collection logs are included in Appendix A. The samples were analyzed for the parameters listed in Table 3-5 using methods outlined in Section 3.3.

3.1.6 Surface Water Sampling

Six surface water samples were collected at the DEH Compound, Parcels 64(7) and 1(7), at the locations shown on Figure 3-1. The surface water sampling locations and rationale are listed in Table 3-1. Surface water sample designations and QA/QC samples are listed in Table 3-7. Three of the surface water samples were collected from adjacent Parcel 151. These surface water

Table 3-4

Groundwater Elevations
DEH Compound, Parcels 64(7) and 1(7)
Fort McClellan, Calhoun County, Alabama

Well Location	Date	Depth to Water (ft BTOC)	Top of Casing Elevation (ft msl)	Ground Elevation (ft msl)	Groundwater Elevation (ft msl)
FTA-64-GP02	14-Mar-00	9.88	737.70	736.81	727.82
FTA-64-GP04	14-Mar-00	7.92	734.43	733.61	726.51
FTA-64-GP06	14-Mar-00	3.75	736.26	736.05	732.51
FTA-64-GP08	14-Mar-00	9.05	737.67	736.57	728.62
FTA-64-GP10	14-Mar-00	2.03	744.60	742.11	742.57
FTA-64-GP11	14-Mar-00	3.69	743.49	742.19	739.80
FTA-64-GP12	14-Mar-00	2.50	740.09	739.13	737.59
FTA-64-GP13	14-Mar-00	3.93	736.87	736.18	732.94
FTA-64-GP14	14-Mar-00	9.05	736.35	735.23	727.30
FTA-64-GP15(W)	14-Mar-00	10.37	738.64	739.37	728.27
FTA-64-MW01	14-Mar-00	5.92	737.65	738.05	731.73
FTA-64-MW02	14-Mar-00	6.39	737.31	737.75	730.92
FTA-64-MW03	14-Mar-00	7.60	737.12	737.66	729.52
FTA-64-MW04	14-Mar-00	8.65	737.08	737.51	728.43
FTA-151-GP03	13-Mar-00	6.26	732.18	731.87	725.92
FTA-151-GP05	13-Mar-00	7.26	733.38	733.34	726.12
FTA-151-GP11	13-Mar-00	7.41	738.24	736.23	730.83

BTOC - Below top of casing.
ft - Feet.
msl - Mean sea level.

Table 3-5

Groundwater Sample Designations and QA/QC Samples
DEH Compound, Parcels 64(7) and 1(7)
Fort McClellan, Calhoun County, Alabama

Sample Location	Sample Designation	QA/QC Samples Field Duplicates	Field Splits	MS/MSD	Analytical Suite
FTA-64-GP01	FTA-64-GP01-GW-EA3001R-REG				TCL VOCs, TCL SVOCs, TAL Metals
FTA-64-GP02	FTA-64-GP02-GW-EA3002-REG	FTA-64-GP02-GW-EA3003-FD	FTA-64-GP02-GW-EA3004-FS		TCL VOCs, TCL SVOCs, TAL Metals
FTA-64-GP03	FTA-64-GP03-GW-EA3005R-REG				TCL VOCs, TCL SVOCs, TAL Metals
FTA-64-GP04	FTA-64-GP04-GW-EA3006-REG				TCL VOCs, TCL SVOCs, TAL Metals
FTA-64-GP06	FTA-64-GP06-GW-EA3010-REG			FTA-64-GP06-GW-EA3010-MS FTA-64-GP06-GW-EA3010-MSD	TCL VOCs, TCL SVOCs, TAL Metals, Cl. Pesticides/herbicides, OP Pesticides
FTA-64-GP07	FTA-64-GP07-GW-EA3011-REG			FTA-64-GP07-GW-EA3011MS[a] FTA-64-GP07-GW-EA3011MSD[a]	TCL VOCs, TCL SVOCs, TAL Metals, Cl. Pesticides/herbicides, OP Pesticides
FTA-64-GP08	FTA-64-GP08-GW-EA3012-REG				TCL VOCs, TCL SVOCs, TAL Metals, Cl. Pesticides/herbicides, OP Pesticides
FTA-64-GP09	FTA-64-GP09-GW-EA3013-REG				TCL VOCs, TCL SVOCs, TAL Metals
	FTA-64-GP09-GW-EA3013R-REG				TCL VOCs, TCL SVOCs, TAL Metals, Cl. Pesticides/herbicides, OP Pesticides
FTA-64-GP10	FTA-64-GP10-GW-EA3014-REG				TCL VOCs, TCL SVOCs, TAL Metals
FTA-64-GP11	FTA-64-GP11-GW-EA3015-REG				TCL VOCs, TCL SVOCs, TAL Metals
FTA-64-GP12	FTA-64-GP12-GW-EA3016-REG				TCL VOCs, TCL SVOCs, TAL Metals, Cl. Pesticides/herbicides, OP Pesticides
FTA-64-GP13	FTA-64-GP13-GW-EA3017-REG				TCL VOCs, TCL SVOCs, TAL Metals
FTA-64-GP14	FTA-64-GP14-GW-EA3018-REG				TCL VOCs, TCL SVOCs, TAL Metals, Cl. Pesticides/herbicides, OP Pesticides
FTA-64-GP15(W)	FTA-64-GP15-GW-EA3007-REG	FTA-64-GP15-GW-EA3008-FD			TCL VOCs, TCL SVOCs, TAL Metals, Cl. Pesticides/herbicides, OP Pesticides
FTA-64-MW01	FTA-64-MW01-GW-EA3019-REG				TCL VOCs, TCL SVOCs, TAL Metals
FTA-64-MW02	FTA-64-MW02-GW-EA3020-REG				TCL VOCs, TCL SVOCs, TAL Metals
FTA-64-MW03	FTA-64-MW03-GW-EA3021-REG				TCL VOCs, TCL SVOCs, TAL Metals
FTA-64-MW04	FTA-64-MW04-GW-EA3022-REG				TCL VOCs, TCL SVOCs, TAL Metals

[a] Analyzed for VOCs, SVOCs, and metals only.
Groundwater samples were collected from the approximate midpoint of the saturated screened interval of the monitoring well.

Table 3-5

Groundwater Sample Designations and QA/QC Samples
DEH Compound, Parcels 64(7) and 1(7)
Fort McClellan, Calhoun County, Alabama

FD - Field duplicate.
FS - Field split.
ft. bgs - Feet below ground surface.
MS/MSD - Matrix spike/matrix spike duplicate.
QA/QC - Quality assurance/quality control.
REG - Field sample.
SVOC - Semivolatile organic compound.
TAL - Target analyte list.
TCL - Target compound list.
VOC - Volatile organic compound.

Table 3-6

Groundwater and Surface Water Field Parameters
DEH Compound, Parcels 64(7) and 1(7)
Fort McClellan, Calhoun County, Alabama

Sample Location	Sample Date	Media	Specific Conductivity (mS/cm)[a]	Dissolved Oxygen (mg/L)	ORP (mV)	Temperature (°C)	Turbidity (NTU)	pH (SU)
FTA-64-GP01	20-Jul-00	GW	1.04	0.47	NR	30.3	3.2	6.57
FTA-64-GP02	25-Jan-99	GW	1.21	1.59	-8	19.23	191.6	7.28
FTA-64-GP03	8-Sep-00	GW	1.44	0.66	NR	22.90	28.3	7.03
FTA-64-GP04	21-Jan-99	GW	1.12	0.14	-14	19.14	NR (>100)[b]	6.68
FTA-64-GP06	20-Jan-99	GW	0.88	0.57	90	20.62	789.5	6.92
FTA-64-GP07	23-Oct-98	GW	0.99	1.79	-87	18.78	296.4	6.56
FTA-64-GP08	19-Jan-99	GW	0.37	5.10	-16	9.43	830.4	7.23
FTA-64-GP09[c]	23-Oct-98	GW	1.26	5.76	-71	26.43	154.6	6.51
FTA-64-GP09[d]	20-Jul-00	GW	2.33	0.40	-55	24.60	24.8	6.76
FTA-64-GP10	18-Jan-99	GW	1.31	0.12	-42	20.93	86.2	6.69
FTA-64-GP11	18-Jan-99	GW	1.71	0.32	0	18.14	250.4	6.65
FTA-64-GP12	21-Jan-99	GW	0.93	1.10	-42	19.02	298.0	7.15
FTA-64-GP13	20-Jan-99	GW	1.10	0.32	180	20.58	214.8	7.05
FTA-64-GP14	18-Jan-99	GW	0.45	0.49	-208	19.12	353.7	6.84
FTA-64-GP15(W)	20-Jan-99	GW	NR	2.14	217	19.53	5.8	6.81
FTA-64-MW01	16-Nov-98	GW	2.14	0.99	-60	23.39	0.0	6.90
FTA-64-MW02	13-Nov-98	GW	1.00	5.04	134	21.48	0.0	7.07
FTA-64-MW03	16-Nov-98	GW	1.95	NR	-74	22.18	0.0	7.07
FTA-64-MW04	16-Nov-98	GW	2.26	0.24	-59	23.30	0.0	7.05
FTA-64-SW/SD01	26-Jan-99	SW	0.71	11.87	NR	16.08	1.2	7.52
FTA-64-SW/SD02	16-Mar-99	SW	0.34	16.21	NR	8.50	52.0	6.64
FTA-64-SW/SD03	27-Jan-99	SW	0.18	10.10	NR	11.13	10.2	6.10
FTA-151-SW/SD01	23-Oct-98	SW	0.13	16.02	289	11.99	0.8	7.38
FTA-151-SW/SD02	23-Oct-98	SW	0.14	15.06	290	13.13	0.3	7.25
FTA-151-SW/SD03	23-Oct-98	SW	0.14	14.86	297	14.52	0.7	7.31

[a] Specific conductivity values standardized to millisiemens per centimeter.
[b] Estimated turbidity based on visual observation.
[c] Direct-push well. Reinstalled with hollow-stem auger on July 20, 2000.
[d] Hollow-stem auger well.

°C - Degrees Celsius.
GW - Groundwater.
mg/L - Milligrams per liter.
mS/cm - Millisiemens per centimeter.
mV - Millivolts.
ORP - Oxidation-reduction potential.
NR - Not recorded.
NTUs - Nephelometric turbidity units.
SU - Standard units.
SW - Surface water.

samples are included in the evaluation of the DEH Compound because they are located hydraulically downgradient from the site. The actual sampling locations were determined in the field, based on drainage pathways and actual field observations.

Sample Collection. Surface water samples were collected in accordance with the procedures specified in Section 4.9.1.3 of the SAP (IT, 2000a). The surface water samples were collected by dipping a stainless-steel pitcher in the water and pouring the water into the sample containers or by dipping the sample containers in the water and allowing the water to fill the sample containers. Surface water samples were collected after field parameters had been measured using a calibrated water quality meter. Surface water field parameters are listed in Table 3-6. Sample collection logs are included in Appendix A. The samples were analyzed for the parameters listed in Table 3-7 using methods outlined in Section 3.3.

3.1.7 Sediment Sampling

Six sediment samples were collected at the same locations as the surface water samples, as shown on Figure 3-1. Sediment sampling locations and rationale are presented in Table 3-1. The sediment sample designations and QA/QC samples are listed in Table 3-7. Three of the sediment samples were collected from adjacent Parcel 151. These sediment samples are included in the evaluation of the DEH Compound because they are located hydraulically downgradient from the site. The actual sediment sampling locations were determined in the field, based on drainage pathways and actual field observations.

Sample Collection. Sediment samples were collected in accordance with the procedures specified in Section 4.9.1.2 of the SAP (IT, 2000a). Sediments were collected with a stainless-steel spoon and placed in a clean stainless-steel bowl. Samples for VOC analyses were then immediately collected from the stainless-steel bowl with three EnCore® samplers. The remaining portion of the sample was homogenized and placed in the appropriate sample containers. Sample collection logs are included in Appendix A. The sediment samples were analyzed for the parameters listed in Table 3-7 using methods outlined in Section 3.3.

3.2 Surveying of Sample Locations

Sample locations were surveyed using global positioning system survey techniques described in Section 4.3 of the SAP (IT, 2000a), and conventional civil survey techniques described in Section 4.19 of the SAP (IT, 2000a). Horizontal coordinates were referenced to the U.S. State Plane Coordinate System, Alabama East Zone, North American Datum of 1983. Elevations were

Table 3-7

Surface Water and Sediment Sample Designations and QA/QC Samples
DEH Compound, Parcels 64(7) and 1(7)
Fort McClellan, Calhoun County, Alabama

Sample Location	Sample Designation	Sample Depth (ft. bgs)	QA/QC Samples Field Duplicates	Field Splits	MS/MSD	Analytical Suite
FTA-64-SW/SD01	FTA-64-SW/SD01-SW-EA2001-REG	NA				TCL VOCs, TCL SVOCs, TAL Metals, Cl. Pesticides/herbicides, OP Pesticides
	FTA-64-SW/SD01-SD-EA1001-REG	0-0.5				TCL VOCs, TCL SVOCs, TAL Metals, Cl. Pesticides/herbicides, OP Pesticides, TOC, and Grain Size
FTA-64-SW/SD02	FTA-64-SW/SD02-SW-EA2002-REG	NA				TCL VOCs, TCL SVOCs, TAL Metals, Cl. Pesticides/herbicides, OP Pesticides
	FTA-64-SW/SD02-SD-EA1004-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals, Cl. Pesticides/herbicides, OP Pesticides, PCBs, TOC, and Grain Size
FTA-64-SW/SD03	FTA-64-SW/SD03-SW-EA2003-REG	NA				TCL VOCs, TCL SVOCs, TAL Metals, Cl. Pesticides/herbicides, OP Pesticides
	FTA-64-SW/SD03-SD-EA1005-REG	0-0.5	FTA-64-SW/SD03-SD-EA1002-FD	FTA-64-SW/SD03-SD-EA1003-FS		TCL VOCs, TCL SVOCs, TAL Metals, Cl. Pesticides/herbicides, OP Pesticides, PCBs, TOC, and Grain Size
FTA-151-SW/SD01	FTA-151-SW/SD01-SW-BJ2001-REG	NA				TCL VOCs, TCL SVOCs, TAL Metals, Cl. Pesticides/herbicides, OP Pesticides
	FTA-151-SW/SD01-SD-BJ1001-REG	0-0.5				TCL VOCs, TCL SVOCs, TAL Metals, Cl. Pesticides/herbicides, OP Pesticides, PCBs, TOC, and Grain Size
FTA-151-SW/SD02	FTA-151-SW/SD02-SW-BJ2002-REG	NA				TCL VOCs, TCL SVOCs, TAL Metals, Cl. Pesticides/herbicides, OP Pesticides
	FTA-151-SW/SD02-SD-BJ1002-REG	0-0.5				TCL VOCs, TCL SVOCs, TAL Metals, Cl. Pesticides/herbicides, OP Pesticides, PCBs, TOC, and Grain Size
FTA-151-SW/SD03	FTA-151-SW/SD03-SW-BJ2003-REG	NA				TCL VOCs, TCL SVOCs, TAL Metals, Cl. Pesticides/herbicides, OP Pesticides
	FTA-151-SW/SD03-SD-BJ1003-REG	0-0.5				TCL VOCs, TCL SVOCs, TAL Metals, Cl. Pesticides/herbicides, OP Pesticides, PCBs, TOC, and Grain Size

Cl. - Chlorinated.
FD - Field duplicate.
FS - Field split.

QA/QC - Quality assurance/quality control.
REG - Field sample.
SVOC - Semivolatile organic compound.

Table 3-7

Surface Water and Sediment Sample Designations and QA/QC Samples
DEH Compound, Parcels 64(7) and 1(7)
Fort McClellan, Calhoun County, Alabama

ft. bgs - Feet below ground surface.
MS/MSD - Matrix spike/matrix spike duplicate.
NA - Not applicable.
OP - Organophosphorus.
PCB - Polychlorinated biphenyl.
TAL - Target analyte list.
TCL - Target compound list.
TOC - Total organic carbon.
VOC - Volatile organic compound.

referenced to the North American Vertical Datum of 1988. Horizontal coordinates and elevations are included in Appendix D.

3.3 Analytical Program

Samples collected during the SI were analyzed for various chemical and physical parameters. The specific suite of analyses performed was based on the potential site-specific chemicals historically at the site and EPA, ADEM, FTMC, and USACE requirements. Target analyses for samples collected at the DEH Compound, Parcels 64(7) and 1(7), included the following parameters:

- Target compound list VOCs – EPA Method 5035/8260B
- Target compound list semivolatile organic compounds (SVOC) – EPA Method 8270C
- Target analyte list metals – EPA Method 6010B/7000
- Chlorinated pesticides – EPA Method 8081A
- Organophosphorus pesticides – EPA Method 8141A
- Chlorinated herbicides – EPA Method 8151A
- Dioxins – EPA Method 8290
- Polychlorinated biphenyls (PCB) – EPA Method 8082
- Total organic carbon (TOC) – EPA Method 9060 (sediment only)
- Grain size – American Society for Testing and Materials Method D421/D422 (sediment only).

The samples were analyzed using EPA SW-846 methods, including Update III methods where applicable, as presented in Table 6-1 in Appendix B of the SAP (IT, 2000a). Data were reported and evaluated in accordance with Corps of Engineers South Atlantic Savannah Level B criteria (USACE, 1994) and the stipulated requirements for the generation of definitive data (Section 3.1.2 of Appendix B of the SAP [IT, 2000a]). Chemical data were reported via hard copy data packages by the laboratory using Contract Laboratory Program-like forms. These packages were validated in accordance with EPA National Functional Guidelines by Level III criteria. A summary of validated data is included in Appendix E. The Data Validation Summary Report is included as Appendix F.

3.4 Sample Preservation, Packaging, and Shipping

Sample preservation, packaging, and shipping followed requirements specified in Section 4.13.2 of the SAP (IT, 2000a). Sample containers, sample volumes, preservatives, and holding times for the analyses required in this SI are listed in Section 5.0, Table 5-1, of Appendix B of the SAP (IT, 2000a). Sample documentation and chain-of-custodies were recorded as specified in Section 4.13 of the SAP (IT, 2000a).

Completed analysis request and chain-of-custody records (Appendix A) were secured and included with each shipment of sample coolers to Quanterra Environmental Services in Knoxville, Tennessee. Split samples were shipped to the USACE South Atlantic Division Laboratory in Marietta, Georgia.

3.5 Investigation-Derived Waste Management and Disposal

Investigation-derived waste (IDW) was managed and disposed as outlined in Appendix D of the SAP (IT, 2000a). The IDW generated during the SI at the DEH Compound, Parcels 64(7) and 1(7), was segregated as follows:

- Drill cuttings
- Purge water from well development and sampling activities, and decontamination fluids
- Spent well materials and personal protective equipment.

Solid IDW was stored inside the fenced area surrounding Buildings 335 and 336 in lined roll-off bins prior to characterization and final disposal. Solid IDW was characterized using toxicity characteristic leaching procedure analyses. Based on the results, drill cuttings, spent well materials, and personal protective equipment generated during the SI were disposed as nonregulated waste at the Industrial Waste Landfill on the Main Post of FTMC.

Liquid IDW was contained in the existing 20,000-gallon sump associated with the Building T-338 Vehicle Washrack. Liquid IDW was characterized by VOC, SVOC, and metals analyses. Based on the analyses, liquid IDW was discharged as nonregulated waste to the FTMC wastewater treatment plant on the Main Post.

3.6 Variances/Nonconformances

Six variances to the SFSP were recorded during completion of the SI at the DEH Compound, Parcels 64(7) and 1(7). The variances did not alter the intent of the investigation or the sampling rationale presented in Table 4-2 of the SFSP (IT, 1998a). The variances to the SFSP are summarized in Table 3-8 and included in Appendix G. There were not any nonconformances to the SFSP recorded during completion of the SI.

3.7 Data Quality

The field sample analytical data are presented in tabular form in Appendix E. The field samples were collected, documented, handled, analyzed, and reported in a manner consistent with the SI work plan; the FTMC SAP and quality assurance plan; and standard, accepted methods and procedures. Sample collection logs pertaining to the collection of these samples were reviewed and organized for this report, and are included in Appendix A. As discussed in Section 3.6, six variances to the SFSP were recorded during completion of the SI. However, the variances did not impact the usability of the data.

Data Validation. A complete (100 percent) Level III data validation effort was performed on the reported analytical data. Appendix F consists of a data validation summary report that was prepared to discuss the results of the validation. Selected results were rejected or otherwise qualified based on the implementation of accepted data validation procedures and practices. These qualified parameters are highlighted in the report. The validation-assigned qualifiers were added to the FTMC IT Environmental Management System^{TM} database for tracking and reporting. The qualified data were used in the comparison to the SSSLs and ESVs. Rejected data (assigned an "R" qualifier) were not used in the comparison to the SSSLs and ESVs.

The data presented in this report, except where qualified, meet the principle data quality objective for this SI.

Table 3-8

Variances to the Site-Specific Field Sampling Plan
DEH Compound, Parcels 64(7) and 1(7)
Fort McClellan, Calhoun County, Alabama

Variance to the SFSP	Justification for Variance	Impact to Site Investigation
Direct-push temporary wells not installed: FTA-64-GP06, FTA-64-GP08, FTA-64-GP10, FTA-64-GP11, FTA-64-GP12, FTA-64-GP13, and FTA-64-GP14.	Groundwater not encountered during drilling operations with direct-push technology.	Drilling with hollow-stem auger rig allowed well completion with sufficient water for development and sampling.
Groundwater samples not collected from direct-push wells FTA-64-GP02 and FTA-64-GP04.	Groundwater was not present in sufficient volume to effectively purge the wells.	Drilling with hollow-stem auger rig allowed well completion with sufficient water for development and sampling.
One additional surface and subsurface soil sample was collected at FTA-64-GP15. Sample location was advanced to front of door at Building 211. This location was not proposed in the final SFSP.	One additional surface and subsurface soil sample was collected because the odor of pesticides was noted at this location.	An additional surface and subsurface soil sample will more accurately determine the presence or absence of any contamination at the location.
Temporary well FTA-64-GP15 was relocated approximately 25 feet southeast of direct-push soil boring FTA-64-GP15.	The hollow-stem auger rig could not access the same location where the direct-push soil boring was advanced because of overhead power lines and underground utility lines.	Relocation of FTA-64-GP15 allowed well completion with sufficient water for development and sampling.
Surface water and sediment samples were not collected at proposed location FTA-64-SW/SD04. Depositional sample FTA-64-DEP02 was collected at that location.	FTA-64-SW/SD04 was not collected because surface water and sediment were not present in the creek. Several attempts were made to collect the surface water and sediment but all were unsuccessful.	A depositional sample was collected at this location.
Sample location FTA-64-GP15 added to sampling agenda at location of FTA-64-GP05. FTA-64-GP05 was moved to southern end of Building 211.	FTA-64-GP05 was moved to the southern end of Building 211 because odor of pesticides was noted there. FTA-64-GP15 was added for additional coverage at Building 211.	Two sample locations will more accurately determine the presence or absence of any contamination at the site.

SFSP - Site-specific field sampling plan.

4.0 Site Characterization

Subsurface investigations performed at the DEH Compound, Parcels 64(7) and 1(7), provided soil, bedrock, and groundwater data used to characterize the geology and hydrogeology of the site.

4.1 Regional and Site Geology

4.1.1 Regional Geology

Calhoun County includes parts of two physiographic provinces, the Piedmont Upland Province and the Valley and Ridge Province. The Piedmont Upland Province occupies the extreme eastern and southeastern portions of the county, and is characterized by metamorphosed sedimentary rocks. The generally accepted range in age of these metamorphics is Cambrian to Devonian.

The majority of Calhoun County, including the Main Post of FTMC, lies within the Appalachian fold and thrust structural belt (Valley and Ridge Province) where southeastward-dipping thrust faults with associated minor folding are the predominant structural features. The fold and thrust belt consists of Paleozoic sedimentary rocks that have been asymmetrically folded and thrust-faulted with major structures and faults striking in a northeast-southwest direction.

Northwestward transport of the Paleozoic rock sequence along the thrust faults has resulted in the imbricate stacking of large slabs of rock referred to as thrust sheets. Within an individual thrust sheet, smaller faults may splay off the larger thrust fault, resulting in imbricate stacking of rock units within an individual thrust sheet (Osborne and Szabo, 1984). Geologic contacts in this region generally strike parallel to the faults and repetition of lithologic units is common in vertical sequences. Geologic formations within the Valley and Ridge Province portion of Calhoun County have been mapped by Warman and Causey (1962), Osborne and Szabo (1984), and Moser and DeJarnette (1992), and vary in age from Lower Cambrian to Pennsylvanian.

The basal unit of the sedimentary sequence in Calhoun County is the Cambrian Chilhowee Group. The Chilhowee Group is comprised of the Cochran, Nichols, Wilson Ridge, and Weisner Formations (Osborne and Szabo, 1984), but in Calhoun County is either undifferentiated or divided into the Cochran and Nichols Formations and an upper undifferentiated Wilson Ridge and Weisner Formation. The Cochran is composed of poorly sorted arkosic sandstone and conglomerate with interbeds of greenish-gray siltstone and mudstone. Massive to laminated greenish-gray and black mudstone makes up the Nichols Formation with thin interbeds of siltstone and very fine-grained sandstone (Szabo et al., 1988). These two formations are mapped only in the eastern part of the county.

The Wilson Ridge and Weisner Formations are undifferentiated in Calhoun County and consist of both coarse-grained and fine-grained clastics. The coarse-grained facies appear to dominate the unit and consist primarily of coarse-grained, vitreous quartzite, and friable, fine- to coarse-grained, orthoquartzitic sandstone, both of which locally contain conglomerate. The fine-grained facies consist of sandy and micaceous shale and silty, micaceous mudstone, which are locally interbedded with the coarse clastic rocks. The abundance of orthoquartzitic sandstone and quartzite suggests that most of the Chilhowee Group bedrock in the vicinity of FTMC belongs to the Weisner Formation (Osborne and Szabo, 1984).

The Cambrian Shady Dolomite overlies the Weisner Formation northeast, east and southwest of the Main Post and consists of interlayered bluish-gray or pale yellowish-gray sandy dolomitic limestone and siliceous dolomite with coarsely crystalline porous chert (Osborne et al., 1989). A variegated shale and clayey silt have been included within the lower part of the Shady Dolomite (Cloud, 1966). Material similar to this lower shale unit was noted in core holes drilled by the Alabama Geologic Survey on FTMC (Osborne and Szabo, 1984). The character of the Shady Dolomite in the FTMC vicinity and the true assignment of the shale at this stratigraphic interval are still uncertain (Osborne, 1999).

The Rome Formation overlies the Shady Dolomite and locally occurs to the northwest and southeast of the Main Post as mapped by Warman and Causey (1962) and Osborne and Szabo (1984), and immediately to the west of Reilly Airfield (Osborne and Szabo, 1984). The Rome Formation consists of variegated thinly interbedded grayish-red-purple mudstone, shale, siltstone, and greenish-red and light gray sandstone, with locally occurring limestone and dolomite. The Conasauga Formation overlies the Rome Formation and occurs along anticlinal axes in the northeastern portion of Pelham Range (Warman and Causey, 1962), (Osborne and Szabo, 1984) and the northern portion of the Main Post (Osborne et al., 1997). The Conasauga Formation is composed of dark-gray, finely to coarsely crystalline medium- to thick-bedded dolomite with minor shale and chert (Osborne et al., 1989).
Overlying the Conasauga Formation is the Knox Group, which is composed of the Copper Ridge and Chepultepec dolomites of Cambro-Ordovician age. The Knox Group is undifferentiated in

Calhoun County and consists of light medium gray, fine to medium crystalline, variably bedded to laminated, siliceous dolomite and dolomitic limestone that weathers to a chert residuum (Osborne and Szabo, 1984). The Knox Group underlies a large portion of the Pelham Range area.

The Ordovician Newala and Little Oak Limestones overlie the Knox Group. The Newala Limestone consists of light to dark gray, micritic, thick-bedded limestone with minor dolomite. The Little Oak Limestone is comprised of dark gray, medium- to thick-bedded, fossiliferous, argillaceous to silty limestone with chert nodules. These limestone units are mapped together as undifferentiated at FTMC and other parts of Calhoun County. The Athens Shale overlies the Ordovician limestone units. The Athens Shale consists of dark-gray to black shale and graptolitic shale with localized interbedded dark gray limestone (Osborne et al., 1989). These units occur within an eroded “window” in the uppermost structural thrust sheet at FTMC and underlie much of the developed area of the Main Post.

Other Ordovician-aged bedrock units mapped in Calhoun County include the Greensport Formation, Colvin Mountain Sandstone, and Sequatchie Formation. These units consist of various siltstones, sandstones, shales, dolomites and limestones, and are mapped as one, undifferentiated unit in some areas of Calhoun County. The only Silurian-age sedimentary formation mapped in Calhoun County is the Red Mountain Formation. This unit consists of interbedded red sandstone, siltstone, and shale with greenish-gray to red silty and sandy limestone.

The Devonian Frog Mountain Sandstone consists of sandstone and quartzitic sandstone with shale interbeds, dolomudstone, and glauconitic limestone (Szabo et al., 1988). This unit locally occurs in the western portion of Pelham Range.

The Mississippian Fort Payne Chert and the Maury Formation overlie the Frog Mountain Sandstone and are composed of dark- to light-gray limestone with abundant chert nodules and greenish-gray to grayish-red phosphatic shale with increasing amounts of calcareous chert toward the upper portion of the formation (Osborne and Szabo, 1984). These units occur in the northwestern portion of Pelham Range. Overlying the Fort Payne Chert is the Floyd Shale, also of Mississippian age, which consists of thin-bedded, fissile brown to black shale with thin intercalated limestone layers and interbedded sandstone. Osborne and Szabo (1984) reassigned the Floyd Shale, which was mapped by Warman and Causey (1962) on the Main Post of FTMC, to the Ordovician Athens Shale on the basis of fossil data.

The Jacksonville Thrust Fault is the most significant structural geologic feature in the vicinity of FTMC, both for its role in determining the stratigraphic relationships in the area and for its contribution to regional water supplies. The trace of the fault extends northeastward for approximately 39 miles between Bynum, Alabama and Piedmont, Alabama. The fault is interpreted as a major splay of the Pell City Fault (Osborne and Szabo, 1984). The Ordovician sequence comprising the Eden thrust sheet is exposed at FTMC through an eroded “window” or “fenster” in the overlying thrust sheet. Rocks within the window display complex folding with the folds being overturned, and tight to isoclinal. The carbonates and shales locally exhibit well-developed cleavage (Osborne and Szabo, 1984). The FTMC window is framed on the northwest by the Rome Formation, north by the Conasauga Formation, northeast, east, and southwest by the Shady Dolomite, and southeast and southwest by the Chilhowee Group (Osborne et al., 1997).

4.1.2 Site Geology

Two soil types are mapped at the DEH Compound, Parcels 64(7) and 1(7): Philo and Stendal fine sandy loam and Montevallo shaley, silty, clay loam. The Philo and Stendal fine sandy loam is mapped across the eastern fourth of the parcel next to Cane Creek. The Philo and Stendal fine sandy loams are developed in alluvial material derived from sandstone, shale, and limestone. The surface soil ranges from grayish brown to dark brown and the subsoil ranges from dark brown to yellowish brown. The Montevallo shaley, silty, clay loam is mapped across the rest of the parcel. The Montevallo shaley, silty, clay loam is yellowish brown in color, highly eroded, and generally developed from interbedded shale and fine-grained sandstone (U.S. Department of Agriculture, 1961).

The bedrock at the site is mapped as the undifferentiated Mississippian/Ordovician Floyd and Athens Shale (Osborne et. al., 1997). The Floyd and Athens Shale consists of brown, dark-gray to black shale with localized interbedded limestone and sandstone (Osborne et. al., 1989).

A geologic cross section was constructed from direct-push and hollow-stem auger data collected during the SI, as shown on Figure 4-1. The geologic cross section location is shown on Figure 3-1. The soil encountered during the direct-push and drilling activities at the DEH Compound, Parcels 64(7) and 1(7), ranged from a yellowish-brown to reddish-brown silty clay from ground surface to approximately 6 to 8 feet bgs. Gray to black weathered shale was encountered beneath the silty clay across most of the site except near Cane Creek, where yellowish-brown to reddish-brown gravelly, clayey sand was observed beneath the silty clay. Fill material consisting of coal and coal dust, clay, and gravel was also observed in soil boring FTA-64-GP15(W) from ground surface to approximately 8 feet bgs.

4.2 Site Hydrology

4.2.1 Surface Hydrology

Precipitation in the form of rainfall averages about 54 inches annually in Anniston, Alabama, with infiltration rates annually exceeding evapotranspiration rates (U.S. Department of Commerce, National Oceanic and Atmospheric Administration, 1998). The major surface water features at the Main Post of FTMC include Remount Creek, Cane Creek, and Cave Creek. These waterways flow in a general northwest to westerly direction towards the Coosa River on the western boundary of Calhoun County.

The elevation of DEH Compound is approximately 740 feet above mean sea level. The land surface at the site gently slopes to the southwest toward Cane Creek. Surface water runoff at the site collects in storm drains, which empty into Cane Creek.

4.2.2 Hydrogeology

Static groundwater levels were measured in temporary, permanent, and existing monitoring wells at FTMC in March 2000 (Table 3-4). Groundwater elevations were calculated by measuring the depth to groundwater relative to the surveyed top-of-casing elevations. Figure 4-2 is a groundwater elevation contour map constructed from the March 2000 data. Based on the groundwater elevation contour map, horizontal groundwater flow at the site is from northeast to southwest toward Cane Creek. The hydraulic gradient across this area is approximately 0.02 feet per foot.

5.0 Summary of Analytical Results

The results of the chemical analyses of samples collected at the DEH Compound, Parcels 64(7) and 1(7), indicate that metals, VOCs, SVOCs, pesticides/herbicides, and dioxins were detected in the various site media. To evaluate whether the detected constituents present an unacceptable risk to human health and the environment, analytical results were compared to the human health SSSLs and ESVs for FTMC. The SSSLs and ESVs were developed by IT for human health and ecological risk evaluations as part of the ongoing SIs being performed under the BRAC Environmental Restoration Program at FTMC.

Metal concentrations exceeding the SSSLs and ESVs were subsequently compared to metals background screening values (background concentrations) (SAIC, 1998) to determine if the metals concentrations are within natural background concentrations. Summary statistics for background metals samples collected at FTMC (SAIC, 1998) are included in Appendix H. Additionally, SVOC concentrations in surface and depositional soils that exceeded the SSSLs and ESVs were compared to PAH background screening values, where available. The PAH background screening values were derived from PAH analytical data from 18 parcels at FTMC that were determined to represent anthropogenic activity (IT, 2000b). PAH background screening values were developed for two categories of surface soils: beneath asphalt and adjacent to asphalt. The PAH background screening values for soils adjacent to asphalt are the more conservative (i.e., lower) of the PAH background values and are the values used herein for comparison.

Six compounds were quantified by both SW-846 Method 8260B (as VOC) and Method 8270C (as SVOC), including 1,2,4-trichlorobenzene, 1,4-dichlorobenzene, 1,3-dichlorobenzene, 1,2-dichlorobenzene, hexachlorobutadiene, and naphthalene. Method 8260B yields a reporting limit (RL) of 0.005 mg/kg, while Method 8270C has a RL of 0.330 mg/kg, which is typical for a soil matrix sample. Because of the direct nature of the Method 8260B analysis and its resulting lower RL, this method should be considered superior to Method 8270C when quantifying low levels (0.005 to 0.330 mg/kg) of these compounds. Method 8270C and its associated methylene chloride extraction step is superior, however, when dealing with samples that contain higher concentrations (greater than 0.330 mg/kg) of these compounds. Therefore, all data were considered and none were categorically excluded. Data validation qualifiers were helpful in evaluating the usability of data, especially if calibration, blank contamination, precision, or accuracy indicator anomalies were encountered. The validation qualifiers and concentrations reported (e.g., whether concentrations were less than or greater than 0.330 mg/kg) were used to determine which analytical method was likely to return the more accurate result.

The following sections and Tables 5-1 through 5-5 summarize the results of the comparison of detected constituents to the SSSLs, ESVs, and background screening values. Complete analytical results are presented in Appendix E.

5.1 Surface and Depositional Soil Analytical Results

Eight surface soil samples and one depositional soil sample were collected for chemical analyses at the DEH Compound, Parcels 64(7) and 1(7). Surface and depositional soil samples were collected from the upper 1 foot of soil at the locations shown on Figure 3-1. Analytical results were compared to residential human health SSSLs, ESVs, and background screening values (metals and PAHs), as presented in Table 5-1.

Metals. Twenty-one metals were detected in surface and depositional soil samples collected at the DEH Compound, Parcels 64(7) and 1(7). Mercury, silver, and sodium were detected only at sample location FTA-64-DEP02. In addition, sample location FTA-64-DEP02 contained each of the detected metals.

The concentrations of five metals (aluminum, arsenic, barium, iron, and manganese) exceeded SSSLs. Of these metals, arsenic (FTA-64-GP08), barium (FTA-64-DEP02), iron (FTA-64-GP07 and FTA-64-GP08), and manganese (FTA-64-DEP02) concentrations also exceeded their respective background concentration. With the exception of the barium result, the concentrations of these metals were within the range of background values determined by SAIC (1998) (Appendix H). The barium concentration (849 mg/kg) exceeded the range of background values (124 mg/kg to 288 mg/kg).

The following metals were detected at concentrations exceeding ESVs and their respective background concentration: arsenic (one location), barium (one location), beryllium (two locations), cobalt (one location), copper (three locations), iron (two locations), manganese (one location), selenium (four locations), and zinc (five locations). With the exception of beryllium (FTA-64-GP07 and FTA-64-GP08), copper (FTA-64-DEP02, FTA-64-GP07, and FTA-64-GP08), and selenium (FTA-64-GP07 and FTA-64-GP08), the concentrations of these metals were within the range of background values determined by SAIC (1998).

Table 5-1

Surface and Depositional Soil Analytical Results
DEH Compound, Parcels 64(7) and 1(7)
Fort McClellan, Calhoun County, Alabama

(Page 1 of 9)

Parcel Sample Location Sample Number Sample Date Sample Depth (Feet)					FTA-64 FTA-64-DEP02 EA0028 16-Mar-99 0- 1					FTA-64 FTA-64-GP01 EA0001 13-Oct-98 0- 1					FTA-64 FTA-64-GP02 EA0003 13-Oct-98 0- 1				
Parameter	**Units**	**BKG[a]**	**SSSL[b]**	**ESV[b]**	**Result**	**Qual**	**>BKG**	**>SSSL**	**>ESV**	**Result**	**Qual**	**>BKG**	**>SSSL**	**>ESV**	**Result**	**Qual**	**>BKG**	**>SSSL**	**>ESV**
METALS																			
Aluminum	mg/kg	1.63E+04	7.80E+03	5.00E+01	2.09E+03				YES	1.53E+03				YES	7.90E+03			YES	YES
Arsenic	mg/kg	1.37E+01	4.26E-01	1.00E+01	5.60E+00			YES		1.40E+00			YES		3.10E+00			YES	
Barium	mg/kg	1.24E+02	5.47E+02	1.65E+02	8.49E+02		YES	YES	YES	ND					ND				
Beryllium	mg/kg	8.00E-01	9.60E+00	1.10E+00	2.90E-01	J				ND					7.40E-01				
Cadmium	mg/kg	2.90E-01	6.25E+00	1.60E+00	5.00E-01	J	YES			ND					ND				
Calcium	mg/kg	1.72E+03	NA	NA	6.81E+04		YES			1.65E+04		YES			1.75E+04		YES		
Chromium	mg/kg	3.70E+01	2.32E+01	4.00E-01	2.23E+01				YES	2.20E+01				YES	2.07E+01				YES
Cobalt	mg/kg	1.52E+01	4.68E+02	2.00E+01	1.82E+01		YES			ND					ND				
Copper	mg/kg	1.27E+01	3.13E+02	4.00E+01	7.29E+01		YES		YES	4.20E+00					2.31E+01		YES		
Iron	mg/kg	3.42E+04	2.34E+03	2.00E+02	2.13E+04			YES	YES	7.03E+03			YES	YES	2.29E+04			YES	YES
Lead	mg/kg	4.01E+01	4.00E+02	5.00E+01	2.48E+01					3.80E+00					1.24E+01				
Magnesium	mg/kg	1.03E+03	NA	4.40E+05	3.22E+04		YES			8.90E+03		YES			9.48E+03		YES		
Manganese	mg/kg	1.58E+03	3.63E+02	1.00E+02	3.11E+03		YES	YES	YES	9.93E+01	J				8.16E+01	J			
Mercury	mg/kg	8.00E-02	2.33E+00	1.00E-01	4.00E-02					ND					ND				
Nickel	mg/kg	1.03E+01	1.54E+02	3.00E+01	1.93E+01		YES			8.30E+00					7.50E+00				
Potassium	mg/kg	8.00E+02	NA	NA	2.16E+02	J				ND					5.99E+02				
Selenium	mg/kg	4.80E-01	3.91E+01	8.10E-01	9.60E-01		YES		YES	ND					6.60E-01		YES		
Silver	mg/kg	3.60E-01	3.91E+01	2.00E+00	6.20E-01	J	YES			ND					ND				
Sodium	mg/kg	6.34E+02	NA	NA	1.18E+02	B				ND					ND				
Vanadium	mg/kg	5.88E+01	5.31E+01	2.00E+00	9.50E+00				YES	1.11E+01				YES	7.60E+00				YES
Zinc	mg/kg	4.06E+01	2.34E+03	5.00E+01	1.74E+02		YES		YES	1.13E+01					3.57E+01				
VOLATILE ORGANIC COMPOUNDS																			
1,2,4-Trimethylbenzene	mg/kg	NA	3.88E+02	1.00E-01	ND					ND					ND				
1,2-Dimethylbenzene	mg/kg	NA	1.55E+04	5.00E-02	ND					ND					ND				
1,3,5-Trimethylbenzene	mg/kg	NA	3.88E+02	1.00E-01	ND					ND					ND				
2-Butanone	mg/kg	NA	4.66E+03	8.96E+01	ND					ND					ND				
Acetone	mg/kg	NA	7.76E+02	2.50E+00	ND					1.90E-02	B				2.80E-01	J			
Chlorobenzene	mg/kg	NA	1.55E+02	5.00E-02	ND					ND					ND				
Ethylbenzene	mg/kg	NA	7.77E+02	5.00E-02	ND					ND					ND				
Methylene chloride	mg/kg	NA	8.41E+01	2.00E+00	3.00E-03	B				2.80E-03	B				2.00E-03	B			
Naphthalene	mg/kg	NA	1.55E+02	1.00E-01	ND					ND					ND				
Tetrachloroethene	mg/kg	NA	1.21E+01	1.00E-02	ND					ND					ND				
Toluene	mg/kg	NA	1.55E+03	5.00E-02	ND					ND					ND				
Trichloroethene	mg/kg	NA	5.72E+01	1.00E-03	ND					ND					ND				
Trichlorofluoromethane	mg/kg	NA	2.33E+03	1.00E-01	ND					ND					ND				
cis-1,2-Dichloroethene	mg/kg	NA	7.77E+01	1.00E-01	ND					ND					ND				
m,p-Xylenes	mg/kg	NA	1.55E+04	5.00E-02	ND					ND					ND				
n-Propylbenzene	mg/kg	NA	7.77E+01	NA	ND					ND					ND				
p-Cymene	mg/kg	NA	1.55E+03	NA	ND					ND					ND				

Table 5-1

Surface and Depositional Soil Analytical Results
DEH Compound, Parcels 64(7) and 1(7)
Fort McClellan, Calhoun County, Alabama

(Page 2 of 9)

Parcel					FTA-64					FTA-64					FTA-64				
Sample Location					FTA-64-DEP02					FTA-64-GP01					FTA-64-GP02				
Sample Number					EA0028					EA0001					EA0003				
Sample Date					16-Mar-99					13-Oct-98					13-Oct-98				
Sample Depth (Feet)					0- 1					0- 1					0- 1				
Parameter	Units	BKG[a]	SSSL[b]	ESV[b]	Result	Qual	>BKG	>SSSL	>ESV	Result	Qual	>BKG	>SSSL	>ESV	Result	Qual	>BKG	>SSSL	>ESV
SEMIVOLATILE ORGANIC COMPOUNDS																			
2,4,5-Trichlorophenol	mg/kg	NA	7.77E+02	4.00E+00	ND					ND					ND				
2-Methylnaphthalene	mg/kg	NA	1.55E+02	NA	ND					ND					ND				
Acenaphthene	mg/kg	7.02E-01	4.63E+02	2.00E+01	3.70E-02	J				ND					ND				
Anthracene	mg/kg	9.35E-01	2.33E+03	1.00E-01	1.10E-01	J			YES	ND					ND				
Benzo(a)anthracene	mg/kg	1.19E+00	8.51E-01	5.21E+00	4.50E-01	J				ND					ND				
Benzo(a)pyrene	mg/kg	1.42E+00	8.51E-02	1.00E-01	4.30E-01	J		YES	YES	5.40E-02	J				ND				
Benzo(b)fluoranthene	mg/kg	1.66E+00	8.51E-01	5.98E+01	6.20E-01	J				ND					ND				
Benzo(ghi)perylene	mg/kg	9.55E-01	2.32E+02	1.19E+02	2.70E-01	J				ND					ND				
Benzo(k)fluoranthene	mg/kg	1.45E+00	8.51E+00	1.48E+02	2.30E-01	J				ND					ND				
Carbazole	mg/kg	NA	3.11E+01	NA	1.10E-01	J				ND					ND				
Chrysene	mg/kg	1.40E+00	8.61E+01	4.73E+00	4.80E-01	J				4.30E-02	J				ND				
Dibenz(a,h)anthracene	mg/kg	7.20E-01	8.61E-02	1.84E+01	ND					ND					ND				
Dibenzofuran	mg/kg	NA	3.09E+01	NA	ND					ND					ND				
Fluoranthene	mg/kg	2.03E+00	3.09E+02	1.00E-01	8.10E-01	J			YES	ND					ND				
Fluorene	mg/kg	6.67E-01	3.09E+02	1.22E+02	ND					ND					ND				
Indeno(1,2,3-cd)pyrene	mg/kg	9.37E-01	8.51E-01	1.09E+02	3.10E-01	J				ND					ND				
Naphthalene	mg/kg	3.30E-02	1.55E+02	1.00E-01	ND					ND					ND				
Pentachlorophenol	mg/kg	NA	5.25E+00	2.00E-03	ND					7.60E-02	J			YES	ND				
Phenanthrene	mg/kg	1.08E+00	2.32E+03	1.00E-01	4.30E-01	J			YES	ND					ND				
Pyrene	mg/kg	1.63E+00	2.33E+02	1.00E-01	6.00E-01	J			YES	ND					ND				
bis(2-Ethylhexyl)phthalate	mg/kg	NA	4.52E+01	9.30E-01	2.20E-01	B				6.70E-02	B				ND				
DIOXINS																			
1,2,3,4,6,7,8-Heptachlorodibenzo-p-Dioxin	mg/kg	NA	4.20E-04	1.00E+00	NR					2.10E-04					6.30E-04			YES	
1,2,3,4,6,7,8-Heptachlorodibenzofuran	mg/kg	NA	4.20E-04	1.00E+00	NR					2.30E-05					1.10E-04				
1,2,3,4,7,8,9-Heptachlorodibenzofuran	mg/kg	NA	4.19E-04	1.00E+00	NR					1.30E-06	J				8.20E-06				
1,2,3,4,7,8-Hexachlorodibenzo-p-Dioxin	mg/kg	NA	4.20E-05	1.00E-01	NR					ND					3.80E-06	J			
1,2,3,4,7,8-Hexachlorodibenzofuran	mg/kg	NA	4.20E-05	1.00E-01	NR					2.80E-06	J				1.90E-05	J			
1,2,3,6,7,8-Hexachlorodibenzo-p-Dioxin	mg/kg	NA	4.20E-05	1.00E-01	NR					2.30E-06	J				2.00E-05				
1,2,3,6,7,8-Hexachlorodibenzofuran	mg/kg	NA	4.20E-05	1.00E-01	NR					ND					4.50E-06	J			
1,2,3,7,8,9-Hexachlorodibenzo-p-Dioxin	mg/kg	NA	4.20E-05	1.00E-01	NR					5.00E-07	J				8.50E-06				
1,2,3,7,8-Pentachlorodibenzo-p-Dioxin	mg/kg	NA	8.40E-06	1.00E-02	NR					ND					2.00E-06	J			
1,2,3,7,8-Pentachlorodibenzofuran	mg/kg	NA	8.39E-05	1.00E-01	NR					ND					1.10E-06	J			
2,3,4,6,7,8-Hexachlorodibenzofuran	mg/kg	NA	4.20E-05	1.00E-01	NR					ND					2.30E-06	J			
2,3,4,7,8-Pentachlorodibenzofuran	mg/kg	NA	8.40E-06	1.00E-02	NR					ND					1.60E-06	J			
2,3,7,8-TCDD	mg/kg	NA	4.20E-06	1.00E-02	NR					ND					3.00E-07	J			
Heptachlorodibenzo-p-Dioxin	mg/kg	NA	NA	1.00E+00	NR					4.70E-04	J				1.30E-03	J			
Heptachlorodibenzofuran	mg/kg	NA	NA	1.00E+00	NR					1.20E-04	J				4.90E-04	J			
Hexachlorodibenzo-p-Dioxin	mg/kg	NA	NA	1.00E-01	NR					9.80E-06	J				9.60E-05	J			
Hexachlorodibenzofuran	mg/kg	NA	NA	1.00E-01	NR					2.80E-05	J				2.80E-04	J			
Octachlorodibenzo-p-Dioxin	mg/kg	NA	4.20E-03	1.00E+00	NR					5.60E-03	J		YES		1.30E-02	J		YES	
Octachlorodibenzofuran	mg/kg	NA	4.20E-03	1.00E+00	NR					1.50E-04	J				4.50E-04	J			
Pentachlorodibenzo-p-Dioxin	mg/kg	NA	NA	1.00E-02	NR					ND					6.90E-06	J			
Pentachlorodibenzofuran	mg/kg	NA	NA	1.00E-02	NR					1.30E-06	J				6.50E-05	J			
Tetrachlorodibenzo-p-Dioxin	mg/kg	NA	NA	1.00E-02	NR					ND					6.00E-07	J			
Tetrachlorodibenzofuran,Total	mg/kg	NA	NA	1.00E-02	NR					ND					4.30E-06	J			

Table 5-1

Surface and Depositional Soil Analytical Results
DEH Compound, Parcels 64(7) and 1(7)
Fort McClellan, Calhoun County, Alabama

Parcel / Sample Location / Sample Number / Sample Date / Sample Depth (Feet)					FTA-64 / FTA-64-DEP02 / EA0028 / 16-Mar-99 / 0- 1					FTA-64 / FTA-64-GP01 / EA0001 / 13-Oct-98 / 0- 1					FTA-64 / FTA-64-GP02 / EA0003 / 13-Oct-98 / 0- 1				
Parameter	**Units**	**BKG[a]**	**SSSL[b]**	**ESV[b]**	**Result**	**Qual**	**>BKG**	**>SSSL**	**>ESV**	**Result**	**Qual**	**>BKG**	**>SSSL**	**>ESV**	**Result**	**Qual**	**>BKG**	**>SSSL**	**>ESV**
PESTICIDES																			
4,4'-DDD	mg/kg	NA	2.54E+00	2.50E-03	ND					NR					NR				
4,4'-DDT	mg/kg	NA	1.79E+00	2.50E-03	3.20E-03	J			YES	NR					NR				
Chlordane	mg/kg	NA	1.69E+00	1.00E-01	ND					NR					NR				
Endosulfan sulfate	mg/kg	NA	4.66E+01	3.58E-02	1.30E-02					NR					NR				
Endrin ketone	mg/kg	NA	2.32E-01	1.05E-02	4.10E-03	J				NR					NR				
Methoxychlor	mg/kg	NA	3.89E+01	1.99E-02	1.30E-02	J				NR					NR				
HERBICIDES																			
2,4,5-T	mg/kg	NA	7.77E+01	1.00E-01	ND					NR					NR				
2,4,5-TP	mg/kg	NA	6.21E+01	1.00E-01	ND					NR					NR				

Table 5-1

Surface and Depositional Soil Analytical Results
DEH Compound, Parcels 64(7) and 1(7)
Fort McClellan, Calhoun County, Alabama

Parcel / Sample Location / Sample Number / Sample Date / Sample Depth (Feet)					FTA-64 / FTA-64-GP05 / EA0009 / 13-Oct-98 / 0- 1					FTA-64 / FTA-64-GP06 / EA0012 / 13-Oct-98 / 0- 1					FTA-64 / FTA-64-GP07 / EA0014 / 12-Oct-98 / 0- 1				
Parameter	**Units**	**BKG[a]**	**SSSL[b]**	**ESV[b]**	**Result**	**Qual**	**>BKG**	**>SSSL**	**>ESV**	**Result**	**Qual**	**>BKG**	**>SSSL**	**>ESV**	**Result**	**Qual**	**>BKG**	**>SSSL**	**>ESV**
METALS																			
Aluminum	mg/kg	1.63E+04	7.80E+03	5.00E+01	1.11E+04			YES	YES	4.28E+03				YES	1.32E+04			YES	YES
Arsenic	mg/kg	1.37E+01	4.26E-01	1.00E+01	3.90E+00			YES		4.50E+00			YES		5.40E+00			YES	
Barium	mg/kg	1.24E+02	5.47E+02	1.65E+02	4.35E+01					5.73E+01					3.00E+01				
Beryllium	mg/kg	8.00E-01	9.60E+00	1.10E+00	7.20E-01					ND					1.30E+00		YES		YES
Cadmium	mg/kg	2.90E-01	6.25E+00	1.60E+00	ND					ND					ND				
Calcium	mg/kg	1.72E+03	NA	NA	2.59E+04		YES			1.37E+05		YES			7.15E+02				
Chromium	mg/kg	3.70E+01	2.32E+01	4.00E-01	1.65E+01				YES	1.68E+01				YES	2.26E+01				YES
Cobalt	mg/kg	1.52E+01	4.68E+02	2.00E+01	7.30E+00	J				ND					1.02E+01				
Copper	mg/kg	1.27E+01	3.13E+02	4.00E+01	2.80E+01		YES			1.47E+01		YES			4.38E+01		YES		YES
Iron	mg/kg	3.42E+04	2.34E+03	2.00E+02	2.58E+04			YES	YES	1.41E+04			YES	YES	4.09E+04		YES	YES	YES
Lead	mg/kg	4.01E+01	4.00E+02	5.00E+01	1.12E+01					1.84E+01					1.94E+01				
Magnesium	mg/kg	1.03E+03	NA	4.40E+05	1.57E+04		YES			4.65E+04		YES			1.11E+03		YES		
Manganese	mg/kg	1.58E+03	3.63E+02	1.00E+02	9.03E+01	J				1.29E+02	J			YES	1.13E+02				YES
Mercury	mg/kg	8.00E-02	2.33E+00	1.00E-01	ND					ND					ND				
Nickel	mg/kg	1.03E+01	1.54E+02	3.00E+01	1.25E+01		YES			8.10E+00					1.22E+01		YES		
Potassium	mg/kg	8.00E+02	NA	NA	6.77E+02					ND					8.08E+02		YES		
Selenium	mg/kg	4.80E-01	3.91E+01	8.10E-01	5.90E-01	J	YES			ND					1.80E+00		YES		YES
Silver	mg/kg	3.60E-01	3.91E+01	2.00E+00	ND					ND					ND				
Sodium	mg/kg	6.34E+02	NA	NA	ND					ND					ND				
Vanadium	mg/kg	5.88E+01	5.31E+01	2.00E+00	1.16E+01				YES	1.88E+01				YES	ND				
Zinc	mg/kg	4.06E+01	2.34E+03	5.00E+01	6.05E+01		YES		YES	3.24E+01					7.52E+01		YES		YES
VOLATILE ORGANIC COMPOUNDS																			
1,2,4-Trimethylbenzene	mg/kg	NA	3.88E+02	1.00E-01	ND					ND					ND				
1,2-Dimethylbenzene	mg/kg	NA	1.55E+04	5.00E-02	ND					ND					ND				
1,3,5-Trimethylbenzene	mg/kg	NA	3.88E+02	1.00E-01	ND					ND					ND				
2-Butanone	mg/kg	NA	4.66E+03	8.96E+01	3.30E-03	B				ND					ND				
Acetone	mg/kg	NA	7.76E+02	2.50E+00	4.60E-02	B				ND					3.60E-02	B			
Chlorobenzene	mg/kg	NA	1.55E+02	5.00E-02	ND					ND					ND				
Ethylbenzene	mg/kg	NA	7.77E+02	5.00E-02	ND					ND					ND				
Methylene chloride	mg/kg	NA	8.41E+01	2.00E+00	1.90E-03	B				3.10E-03	B				2.60E-03	B			
Naphthalene	mg/kg	NA	1.55E+02	1.00E-01	ND					ND					ND				
Tetrachloroethene	mg/kg	NA	1.21E+01	1.00E-02	ND					ND					ND				
Toluene	mg/kg	NA	1.55E+03	5.00E-02	ND					ND					ND				
Trichloroethene	mg/kg	NA	5.72E+01	1.00E-03	ND					ND					ND				
Trichlorofluoromethane	mg/kg	NA	2.33E+03	1.00E-01	ND					ND					ND				
cis-1,2-Dichloroethene	mg/kg	NA	7.77E+01	1.00E-01	ND					ND					ND				
m,p-Xylenes	mg/kg	NA	1.55E+04	5.00E-02	ND					ND					ND				
n-Propylbenzene	mg/kg	NA	7.77E+01	NA	ND					ND					ND				
p-Cymene	mg/kg	NA	1.55E+03	NA	ND					ND					7.00E-03				

Table 5-1

Surface and Depositional Soil Analytical Results
DEH Compound, Parcels 64(7) and 1(7)
Fort McClellan, Calhoun County, Alabama

Parcel / Sample Location / Sample Number / Sample Date / Sample Depth (Feet)					FTA-64 / FTA-64-GP05 / EA0009 / 13-Oct-98 / 0- 1					FTA-64 / FTA-64-GP06 / EA0012 / 13-Oct-98 / 0- 1					FTA-64 / FTA-64-GP07 / EA0014 / 12-Oct-98 / 0- 1				
Parameter	**Units**	**BKG[a]**	**SSSL[b]**	**ESV[b]**	**Result**	**Qual**	**>BKG**	**>SSSL**	**>ESV**	**Result**	**Qual**	**>BKG**	**>SSSL**	**>ESV**	**Result**	**Qual**	**>BKG**	**>SSSL**	**>ESV**
SEMIVOLATILE ORGANIC COMPOUNDS																			
2,4,5-Trichlorophenol	mg/kg	NA	7.77E+02	4.00E+00	ND					ND					ND				
2-Methylnaphthalene	mg/kg	NA	1.55E+02	NA	ND					4.20E-02	J				ND				
Acenaphthene	mg/kg	7.02E-01	4.63E+02	2.00E+01	ND					2.80E-01	J				ND				
Anthracene	mg/kg	9.35E-01	2.33E+03	1.00E-01	ND					6.20E-01				YES	ND				
Benzo(a)anthracene	mg/kg	1.19E+00	8.51E-01	5.21E+00	ND					1.50E+00		YES	YES		ND				
Benzo(a)pyrene	mg/kg	1.42E+00	8.51E-02	1.00E-01	4.80E-02	J				1.50E+00		YES	YES	YES	ND				
Benzo(b)fluoranthene	mg/kg	1.66E+00	8.51E-01	5.98E+01	ND					2.10E+00		YES	YES		ND				
Benzo(ghi)perylene	mg/kg	9.55E-01	2.32E+02	1.19E+02	ND					ND					ND				
Benzo(k)fluoranthene	mg/kg	1.45E+00	8.51E+00	1.48E+02	ND					2.00E+00		YES			ND				
Carbazole	mg/kg	NA	3.11E+01	NA	ND					4.00E-01					ND				
Chrysene	mg/kg	1.40E+00	8.61E+01	4.73E+00	ND					1.70E+00		YES			ND				
Dibenz(a,h)anthracene	mg/kg	7.20E-01	8.61E-02	1.84E+01	ND					2.60E-01	J		YES		ND				
Dibenzofuran	mg/kg	NA	3.09E+01	NA	ND					9.50E-02	J				ND				
Fluoranthene	mg/kg	2.03E+00	3.09E+02	1.00E-01	ND					3.80E+00		YES		YES	ND				
Fluorene	mg/kg	6.67E-01	3.09E+02	1.22E+02	ND					2.60E-01	J				ND				
Indeno(1,2,3-cd)pyrene	mg/kg	9.37E-01	8.51E-01	1.09E+02	ND					5.40E-01					ND				
Naphthalene	mg/kg	3.30E-02	1.55E+02	1.00E-01	ND					5.00E-02	J	YES			ND				
Pentachlorophenol	mg/kg	NA	5.25E+00	2.00E-03	ND					ND					ND				
Phenanthrene	mg/kg	1.08E+00	2.32E+03	1.00E-01	ND					2.00E+00		YES		YES	ND				
Pyrene	mg/kg	1.63E+00	2.33E+02	1.00E-01	ND					2.90E+00		YES		YES	ND				
bis(2-Ethylhexyl)phthalate	mg/kg	NA	4.52E+01	9.30E-01	4.50E-02	B				1.00E-01	B				4.80E-02	B			
DIOXINS																			
1,2,3,4,6,7,8-Heptachlorodibenzo-p-Dioxin	mg/kg	NA	4.20E-04	1.00E+00	NR					NR					NR				
1,2,3,4,6,7,8-Heptachlorodibenzofuran	mg/kg	NA	4.20E-04	1.00E+00	NR					NR					NR				
1,2,3,4,7,8,9-Heptachlorodibenzofuran	mg/kg	NA	4.19E-04	1.00E+00	NR					NR					NR				
1,2,3,4,7,8-Hexachlorodibenzo-p-Dioxin	mg/kg	NA	4.20E-05	1.00E-01	NR					NR					NR				
1,2,3,4,7,8-Hexachlorodibenzofuran	mg/kg	NA	4.20E-05	1.00E-01	NR					NR					NR				
1,2,3,6,7,8-Hexachlorodibenzo-p-Dioxin	mg/kg	NA	4.20E-05	1.00E-01	NR					NR					NR				
1,2,3,6,7,8-Hexachlorodibenzofuran	mg/kg	NA	4.20E-05	1.00E-01	NR					NR					NR				
1,2,3,7,8,9-Hexachlorodibenzo-p-Dioxin	mg/kg	NA	4.20E-05	1.00E-01	NR					NR					NR				
1,2,3,7,8-Pentachlorodibenzo-p-Dioxin	mg/kg	NA	8.40E-06	1.00E-02	NR					NR					NR				
1,2,3,7,8-Pentachlorodibenzofuran	mg/kg	NA	8.39E-05	1.00E-01	NR					NR					NR				
2,3,4,6,7,8-Hexachlorodibenzofuran	mg/kg	NA	4.20E-05	1.00E-01	NR					NR					NR				
2,3,4,7,8-Pentachlorodibenzofuran	mg/kg	NA	8.40E-06	1.00E-02	NR					NR					NR				
2,3,7,8-TCDD	mg/kg	NA	4.20E-06	1.00E-02	NR					NR					NR				
Heptachlorodibenzo-p-Dioxin	mg/kg	NA	NA	1.00E+00	NR					NR					NR				
Heptachlorodibenzofuran	mg/kg	NA	NA	1.00E+00	NR					NR					NR				
Hexachlorodibenzo-p-Dioxin	mg/kg	NA	NA	1.00E-01	NR					NR					NR				
Hexachlorodibenzofuran	mg/kg	NA	NA	1.00E-01	NR					NR					NR				
Octachlorodibenzo-p-Dioxin	mg/kg	NA	4.20E-03	1.00E+00	NR					NR					NR				
Octachlorodibenzofuran	mg/kg	NA	4.20E-03	1.00E+00	NR					NR					NR				
Pentachlorodibenzo-p-Dioxin	mg/kg	NA	NA	1.00E-02	NR					NR					NR				
Pentachlorodibenzofuran	mg/kg	NA	NA	1.00E-02	NR					NR					NR				
Tetrachlorodibenzo-p-Dioxin	mg/kg	NA	NA	1.00E-02	NR					NR					NR				
Tetrachlorodibenzofuran,Total	mg/kg	NA	NA	1.00E-02	NR					NR					NR				

Table 5-1

Surface and Depositional Soil Analytical Results
DEH Compound, Parcels 64(7) and 1(7)
Fort McClellan, Calhoun County, Alabama

Parcel / Sample Location / Sample Number / Sample Date / Sample Depth (Feet)					FTA-64 / FTA-64-GP05 / EA0009 / 13-Oct-98 / 0- 1					FTA-64 / FTA-64-GP06 / EA0012 / 13-Oct-98 / 0- 1					FTA-64 / FTA-64-GP07 / EA0014 / 12-Oct-98 / 0- 1				
Parameter	Units	BKG[a]	SSSL[b]	ESV[b]	Result	Qual	>BKG	>SSSL	>ESV	Result	Qual	>BKG	>SSSL	>ESV	Result	Qual	>BKG	>SSSL	>ESV
PESTICIDES																			
4,4'-DDD	mg/kg	NA	2.54E+00	2.50E-03	ND					ND					ND				
4,4'-DDT	mg/kg	NA	1.79E+00	2.50E-03	ND					ND					ND				
Chlordane	mg/kg	NA	1.69E+00	1.00E-01	ND					2.40E-01	J			YES	ND				
Endosulfan sulfate	mg/kg	NA	4.66E+01	3.58E-02	ND					ND					ND				
Endrin ketone	mg/kg	NA	2.32E-01	1.05E-02	ND					ND					ND				
Methoxychlor	mg/kg	NA	3.89E+01	1.99E-02	ND					ND					ND				
HERBICIDES																			
2,4,5-T	mg/kg	NA	7.77E+01	1.00E-01	ND					ND					ND				
2,4,5-TP	mg/kg	NA	6.21E+01	1.00E-01	ND					ND					ND				

Table 5-1

Surface and Depositional Soil Analytical Results
DEH Compound, Parcels 64(7) and 1(7)
Fort McClellan, Calhoun County, Alabama

Parcel Sample Location Sample Number Sample Date Sample Depth (Feet)					FTA-64 FTA-64-GP08 EA0016 12-Oct-98 0- 1					FTA-64 FTA-64-GP14 EA0023 12-Oct-98 0- 1					FTA-64 FTA-64-GP15 EA0025 3-Nov-98 0- 1				
Parameter	**Units**	**BKG[a]**	**SSSL[b]**	**ESV[b]**	**Result**	**Qual**	**>BKG**	**>SSSL**	**>ESV**	**Result**	**Qual**	**>BKG**	**>SSSL**	**>ESV**	**Result**	**Qual**	**>BKG**	**>SSSL**	**>ESV**
METALS																			
Aluminum	mg/kg	1.63E+04	7.80E+03	5.00E+01	1.41E+04			YES	YES	7.59E+03				YES	8.78E+03			YES	YES
Arsenic	mg/kg	1.37E+01	4.26E-01	1.00E+01	1.80E+01		YES	YES	YES	2.20E+00			YES		5.70E+00			YES	
Barium	mg/kg	1.24E+02	5.47E+02	1.65E+02	5.23E+01					2.82E+01					ND				
Beryllium	mg/kg	8.00E-01	9.60E+00	1.10E+00	1.40E+00		YES		YES	7.90E-01					7.30E-01				
Cadmium	mg/kg	2.90E-01	6.25E+00	1.60E+00	5.90E-01		YES			ND					ND				
Calcium	mg/kg	1.72E+03	NA	NA	1.38E+03					9.79E+03		YES			3.26E+04		YES		
Chromium	mg/kg	3.70E+01	2.32E+01	4.00E-01	2.31E+01				YES	1.56E+01				YES	1.71E+01				YES
Cobalt	mg/kg	1.52E+01	4.68E+02	2.00E+01	2.41E+01		YES		YES	8.50E+00					ND				
Copper	mg/kg	1.27E+01	3.13E+02	4.00E+01	5.23E+01		YES		YES	1.95E+01		YES			2.98E+01		YES		
Iron	mg/kg	3.42E+04	2.34E+03	2.00E+02	3.57E+04		YES	YES	YES	1.83E+04			YES	YES	2.68E+04			YES	YES
Lead	mg/kg	4.01E+01	4.00E+02	5.00E+01	2.76E+01					7.90E+00					1.32E+01				
Magnesium	mg/kg	1.03E+03	NA	4.40E+05	3.24E+03		YES			6.92E+03		YES			1.91E+04		YES		
Manganese	mg/kg	1.58E+03	3.63E+02	1.00E+02	2.94E+02				YES	6.89E+01					7.87E+01				
Mercury	mg/kg	8.00E-02	2.33E+00	1.00E-01	ND					ND					ND				
Nickel	mg/kg	1.03E+01	1.54E+02	3.00E+01	2.11E+01		YES			1.39E+01		YES			7.70E+00				
Potassium	mg/kg	8.00E+02	NA	NA	9.05E+02		YES			ND					6.05E+02				
Selenium	mg/kg	4.80E-01	3.91E+01	8.10E-01	1.50E+00		YES		YES	6.50E-01		YES			1.20E+00		YES		YES
Silver	mg/kg	3.60E-01	3.91E+01	2.00E+00	ND					ND					ND				
Sodium	mg/kg	6.34E+02	NA	NA	ND					ND					ND				
Vanadium	mg/kg	5.88E+01	5.31E+01	2.00E+00	ND					ND					1.15E+01				YES
Zinc	mg/kg	4.06E+01	2.34E+03	5.00E+01	1.38E+02		YES		YES	5.39E+01		YES		YES	4.37E+01		YES		
VOLATILE ORGANIC COMPOUNDS																			
1,2,4-Trimethylbenzene	mg/kg	NA	3.88E+02	1.00E-01	ND					3.90E-03	J				2.40E-02	J			
1,2-Dimethylbenzene	mg/kg	NA	1.55E+04	5.00E-02	ND					2.90E-03	J				2.50E-02	J			
1,3,5-Trimethylbenzene	mg/kg	NA	3.88E+02	1.00E-01	ND					ND					1.80E-02	J			
2-Butanone	mg/kg	NA	4.66E+03	8.96E+01	ND					ND					3.50E-03	B			
Acetone	mg/kg	NA	7.76E+02	2.50E+00	1.10E-02	B				8.10E-03	B				4.90E-02	B			
Chlorobenzene	mg/kg	NA	1.55E+02	5.00E-02	ND					ND					3.30E-03	J			
Ethylbenzene	mg/kg	NA	7.77E+02	5.00E-02	ND					2.70E-03	J				7.10E-03	J			
Methylene chloride	mg/kg	NA	8.41E+01	2.00E+00	3.70E-03	B				2.00E-03	B				3.70E-03	B			
Naphthalene	mg/kg	NA	1.55E+02	1.00E-01	ND					ND					6.10E-03	J			
Tetrachloroethene	mg/kg	NA	1.21E+01	1.00E-02	ND					ND					6.90E-03	J			
Toluene	mg/kg	NA	1.55E+03	5.00E-02	ND					3.50E-03	B				4.40E-03	J			
Trichloroethene	mg/kg	NA	5.72E+01	1.00E-03	ND					ND					3.40E-03	J			YES
Trichlorofluoromethane	mg/kg	NA	2.33E+03	1.00E-01	3.50E-03	B				ND					ND				
cis-1,2-Dichloroethene	mg/kg	NA	7.77E+01	1.00E-01	ND					ND					1.80E-03	J			
m,p-Xylenes	mg/kg	NA	1.55E+04	5.00E-02	ND					1.10E-02					1.80E-02	J			
n-Propylbenzene	mg/kg	NA	7.77E+01	NA	ND					ND					6.20E-03	J			
p-Cymene	mg/kg	NA	1.55E+03	NA	ND					ND					ND				

Table 5-1

Surface and Depositional Soil Analytical Results
DEH Compound, Parcels 64(7) and 1(7)
Fort McClellan, Calhoun County, Alabama

(Page 8 of 9)

Parcel Sample Location Sample Number Sample Date Sample Depth (Feet)					FTA-64 FTA-64-GP08 EA0016 12-Oct-98 0- 1					FTA-64 FTA-64-GP14 EA0023 12-Oct-98 0- 1					FTA-64 FTA-64-GP15 EA0025 3-Nov-98 0- 1				
Parameter	**Units**	**BKG[a]**	**SSSL[b]**	**ESV[b]**	**Result**	**Qual**	**>BKG**	**>SSSL**	**>ESV**	**Result**	**Qual**	**>BKG**	**>SSSL**	**>ESV**	**Result**	**Qual**	**>BKG**	**>SSSL**	**>ESV**
SEMIVOLATILE ORGANIC COMPOUNDS																			
2,4,5-Trichlorophenol	mg/kg	NA	7.77E+02	4.00E+00	ND					ND					1.30E-01	J			
2-Methylnaphthalene	mg/kg	NA	1.55E+02	NA	ND					ND					7.90E-02	J			
Acenaphthene	mg/kg	7.02E-01	4.63E+02	2.00E+01	ND					ND					ND				
Anthracene	mg/kg	9.35E-01	2.33E+03	1.00E-01	ND					ND					ND				
Benzo(a)anthracene	mg/kg	1.19E+00	8.51E-01	5.21E+00	8.10E-02	J				ND					ND				
Benzo(a)pyrene	mg/kg	1.42E+00	8.51E-02	1.00E-01	9.00E-02	J		YES		ND					ND				
Benzo(b)fluoranthene	mg/kg	1.66E+00	8.51E-01	5.98E+01	1.10E-01	J				ND					ND				
Benzo(ghi)perylene	mg/kg	9.55E-01	2.32E+02	1.19E+02	ND					ND					ND				
Benzo(k)fluoranthene	mg/kg	1.45E+00	8.51E+00	1.48E+02	1.30E-01	J				ND					ND				
Carbazole	mg/kg	NA	3.11E+01	NA	ND					ND					ND				
Chrysene	mg/kg	1.40E+00	8.61E+01	4.73E+00	1.10E-01	J				ND					4.80E-02	J			
Dibenz(a,h)anthracene	mg/kg	7.20E-01	8.61E-02	1.84E+01	ND					ND					ND				
Dibenzofuran	mg/kg	NA	3.09E+01	NA	ND					ND					ND				
Fluoranthene	mg/kg	2.03E+00	3.09E+02	1.00E-01	2.00E-01	J			YES	ND					4.40E-02	J			
Fluorene	mg/kg	6.67E-01	3.09E+02	1.22E+02	ND					ND					ND				
Indeno(1,2,3-cd)pyrene	mg/kg	9.37E-01	8.51E-01	1.09E+02	ND					ND					ND				
Naphthalene	mg/kg	3.30E-02	1.55E+02	1.00E-01	ND					ND					5.50E-02	J	YES		
Pentachlorophenol	mg/kg	NA	5.25E+00	2.00E-03	ND					ND					7.60E-02	J			YES
Phenanthrene	mg/kg	1.08E+00	2.32E+03	1.00E-01	9.70E-02	J				ND					ND				
Pyrene	mg/kg	1.63E+00	2.33E+02	1.00E-01	1.70E-01	J			YES	ND					5.50E-02	J			
bis(2-Ethylhexyl)phthalate	mg/kg	NA	4.52E+01	9.30E-01	1.70E-01	B				ND					1.10E-01	B			
DIOXINS																			
1,2,3,4,6,7,8-Heptachlorodibenzo-p-Dioxin	mg/kg	NA	4.20E-04	1.00E+00	NR					NR					NR				
1,2,3,4,6,7,8-Heptachlorodibenzofuran	mg/kg	NA	4.20E-04	1.00E+00	NR					NR					NR				
1,2,3,4,7,8,9-Heptachlorodibenzofuran	mg/kg	NA	4.19E-04	1.00E+00	NR					NR					NR				
1,2,3,4,7,8-Hexachlorodibenzo-p-Dioxin	mg/kg	NA	4.20E-05	1.00E-01	NR					NR					NR				
1,2,3,4,7,8-Hexachlorodibenzofuran	mg/kg	NA	4.20E-05	1.00E-01	NR					NR					NR				
1,2,3,6,7,8-Hexachlorodibenzo-p-Dioxin	mg/kg	NA	4.20E-05	1.00E-01	NR					NR					NR				
1,2,3,6,7,8-Hexachlorodibenzofuran	mg/kg	NA	4.20E-05	1.00E-01	NR					NR					NR				
1,2,3,7,8,9-Hexachlorodibenzo-p-Dioxin	mg/kg	NA	4.20E-05	1.00E-01	NR					NR					NR				
1,2,3,7,8-Pentachlorodibenzo-p-Dioxin	mg/kg	NA	8.40E-06	1.00E-02	NR					NR					NR				
1,2,3,7,8-Pentachlorodibenzofuran	mg/kg	NA	8.39E-05	1.00E-01	NR					NR					NR				
2,3,4,6,7,8-Hexachlorodibenzofuran	mg/kg	NA	4.20E-05	1.00E-01	NR					NR					NR				
2,3,4,7,8-Pentachlorodibenzofuran	mg/kg	NA	8.40E-06	1.00E-02	NR					NR					NR				
2,3,7,8-TCDD	mg/kg	NA	4.20E-06	1.00E-02	NR					NR					NR				
Heptachlorodibenzo-p-Dioxin	mg/kg	NA	NA	1.00E+00	NR					NR					NR				
Heptachlorodibenzofuran	mg/kg	NA	NA	1.00E+00	NR					NR					NR				
Hexachlorodibenzo-p-Dioxin	mg/kg	NA	NA	1.00E-01	NR					NR					NR				
Hexachlorodibenzofuran	mg/kg	NA	NA	1.00E-01	NR					NR					NR				
Octachlorodibenzo-p-Dioxin	mg/kg	NA	4.20E-03	1.00E+00	NR					NR					NR				
Octachlorodibenzofuran	mg/kg	NA	4.20E-03	1.00E+00	NR					NR					NR				
Pentachlorodibenzo-p-Dioxin	mg/kg	NA	NA	1.00E-02	NR					NR					NR				
Pentachlorodibenzofuran	mg/kg	NA	NA	1.00E-02	NR					NR					NR				
Tetrachlorodibenzo-p-Dioxin	mg/kg	NA	NA	1.00E-02	NR					NR					NR				
Tetrachlorodibenzofuran,Total	mg/kg	NA	NA	1.00E-02	NR					NR					NR				

Table 5-1

Surface and Depositional Soil Analytical Results
DEH Compound, Parcels 64(7) and 1(7)
Fort McClellan, Calhoun County, Alabama

Parcel / Sample Location / Sample Number / Sample Date / Sample Depth (Feet)					FTA-64 / FTA-64-GP08 / EA0016 / 12-Oct-98 / 0- 1					FTA-64 / FTA-64-GP14 / EA0023 / 12-Oct-98 / 0- 1					FTA-64 / FTA-64-GP15 / EA0025 / 3-Nov-98 / 0- 1				
Parameter	Units	BKG[a]	SSSL[b]	ESV[b]	Result	Qual	>BKG	>SSSL	>ESV	Result	Qual	>BKG	>SSSL	>ESV	Result	Qual	>BKG	>SSSL	>ESV
PESTICIDES																			
4,4'-DDD	mg/kg	NA	2.54E+00	2.50E-03	ND					ND					8.70E+00			YES	YES
4,4'-DDT	mg/kg	NA	1.79E+00	2.50E-03	ND					ND					7.70E+00			YES	YES
Chlordane	mg/kg	NA	1.69E+00	1.00E-01	ND					ND					ND				
Endosulfan sulfate	mg/kg	NA	4.66E+01	3.58E-02	ND					ND					ND				
Endrin ketone	mg/kg	NA	2.32E-01	1.05E-02	ND					ND					ND				
Methoxychlor	mg/kg	NA	3.89E+01	1.99E-02	ND					ND					ND				
HERBICIDES																			
2,4,5-T	mg/kg	NA	7.77E+01	1.00E-01	ND					ND					4.50E-02				
2,4,5-TP	mg/kg	NA	6.21E+01	1.00E-01	ND					ND					4.40E-02				

Analyses performed by Quanterra Environmental Services using U.S. Environmental Protection Agency (EPA) SW-846 analytical methods, including Update III methods where applicable.

[a] Bkg - Background. Concentration listed is two times (2x) the arithmetic mean of background metals concentration given in Science Applications International Corporation (1998), *Final Background Metals Survey Report, Fort McClellan, Alabama* , July.
For SVOCs, value listed is the background screening value for soils adjacent to asphalt as given in IT Corporation (2000), *Final Human Health and Ecological Screening Values and PAH Background Summary Report, Fort McClellan, Calhoun County, Alabama* , July.

[b] Residential human health site-specific screening level (SSSL) and ecological screening value (ESV) as given in IT Corporation (2000), *Final Human Health and Ecological Screening Values and PAH Background Summary Report, Fort McClellan, Calhoun County, Alabama ,* July.

B - Analyte detected in laboratory or field blank at concentration greater than the reporting limit (and greater than zero).

J - Result is greater than the method detection limit but less than or equal to the reporting limit.

mg/kg - Milligrams per kilogram.

NA - Not available.

ND - Not detected.

NR - Analysis not requested.

Qual - Data validation qualifier.

Table 5-2

Subsurface Soil Analytical Results
DEH Compound, Parcels 64(7) and 1(7)
Fort McClellan, Calhoun County, Alabama

Parcel Sample Location Sample Number Sample Date Sample Depth (Feet)				FTA-64 FTA-64-GP01 EA0002 13-Oct-98 9-12				FTA-64 FTA-64-GP02 EA0004 13-Oct-98 9-12				FTA-64 FTA-64-GP03 EA0005 13-Oct-98 8-11				FTA-64 FTA-64-GP04 EA0008 12-Oct-98 1-4			
Parameter	**Units**	**BKG[a]**	**SSSL[b]**	**Result**	**Qual**	**>BKG**	**>SSSL**	**Result**	**Qual**	**>BKG**	**>SSSL**	**Result**	**Qual**	**>BKG**	**>SSSL**	**Result**	**Qual**	**>BKG**	**>SSSL**
METALS																			
Aluminum	mg/kg	1.36E+04	7.80E+03	7.64E+03				7.25E+03				1.46E+04		YES	YES	1.72E+04		YES	YES
Arsenic	mg/kg	1.83E+01	4.26E-01	4.00E+00			YES	2.40E+00			YES	5.80E+00			YES	7.60E+00			YES
Barium	mg/kg	2.34E+02	5.47E+02	6.62E+01				3.20E+01				3.48E+01				6.09E+01			
Beryllium	mg/kg	8.60E-01	9.60E+00	1.20E+00		YES		8.10E-01				9.90E-01		YES		1.10E+00		YES	
Cadmium	mg/kg	2.20E-01	6.25E+00	ND				ND				ND				ND			
Calcium	mg/kg	6.37E+02	NA	8.72E+02		YES		ND				1.10E+03		YES		1.47E+03		YES	
Chromium	mg/kg	3.83E+01	2.32E+01	1.63E+01				1.41E+01				2.38E+01			YES	2.73E+01			YES
Cobalt	mg/kg	1.75E+01	4.68E+02	9.20E+00	J			8.40E+00	J			7.40E+00	J			1.35E+01			
Copper	mg/kg	1.94E+01	3.13E+02	1.57E+01				9.90E+00				2.89E+01		YES		4.79E+01		YES	
Iron	mg/kg	4.48E+04	2.34E+03	2.43E+04			YES	1.99E+04			YES	3.68E+04			YES	3.78E+04			YES
Lead	mg/kg	3.85E+01	4.00E+02	9.00E+00				6.50E+00				1.46E+01				2.32E+01			
Magnesium	mg/kg	7.66E+02	NA	1.26E+03		YES		2.69E+03		YES		2.43E+03	J	YES		7.23E+03		YES	
Manganese	mg/kg	1.36E+03	3.63E+02	1.46E+02	J			1.53E+02	J			7.94E+01	J			2.06E+02			
Mercury	mg/kg	7.00E-02	2.33E+00	ND				ND				ND				ND			
Nickel	mg/kg	1.29E+01	1.54E+02	1.71E+01		YES		1.17E+01				1.08E+01				2.74E+01		YES	
Potassium	mg/kg	7.11E+02	NA	6.47E+02				ND				7.92E+02		YES		7.25E+02		YES	
Selenium	mg/kg	4.70E-01	3.91E+01	7.80E-01		YES		5.60E-01		YES		1.20E+00		YES		1.90E+00		YES	
Vanadium	mg/kg	6.49E+01	5.31E+01	ND				ND				1.37E+01				ND			
Zinc	mg/kg	3.49E+01	2.34E+03	4.34E+01		YES		3.25E+01				5.51E+01		YES		9.19E+01		YES	
VOLATILE ORGANIC COMPOUNDS																			
2-Butanone	mg/kg	NA	4.66E+03	3.80E-03	B			ND				ND				3.80E-03	B		
Acetone	mg/kg	NA	7.76E+02	6.00E-02	B			2.60E-02	B			2.00E-02	B			3.00E-02	B		
Carbon disulfide	mg/kg	NA	7.77E+02	ND				ND				ND				ND			
Methylene chloride	mg/kg	NA	8.41E+01	2.10E-03	B			2.10E-03	B			2.10E-03	B			3.00E-03	B		
Trichloroethene	mg/kg	NA	5.72E+01	ND				ND				ND				ND			
cis-1,2-Dichloroethene	mg/kg	NA	7.77E+01	ND				ND				ND				ND			

Table 5-2

Subsurface Soil Analytical Results
DEH Compound, Parcels 64(7) and 1(7)
Fort McClellan, Calhoun County, Alabama

Parcel				FTA-64				FTA-64				FTA-64				FTA-64			
Sample Location				FTA-64-GP01				FTA-64-GP02				FTA-64-GP03				FTA-64-GP04			
Sample Number				EA0002				EA0004				EA0005				EA0008			
Sample Date				13-Oct-98				13-Oct-98				13-Oct-98				12-Oct-98			
Sample Depth (Feet)				9-12				9-12				8-11				1-4			
Parameter	**Units**	**BKG[a]**	**SSSL[b]**	**Result**	**Qual**	**>BKG**	**>SSSL**	**Result**	**Qual**	**>BKG**	**>SSSL**	**Result**	**Qual**	**>BKG**	**>SSSL**	**Result**	**Qual**	**>BKG**	**>SSSL**
SEMIVOLATILE ORGANIC COMPOUNDS																			
Acenaphthene	mg/kg	NA	4.63E+02	ND				ND				ND				ND			
Anthracene	mg/kg	NA	2.33E+03	ND				ND				ND				ND			
Benzo(a)anthracene	mg/kg	NA	8.51E-01	ND				ND				ND				ND			
Benzo(a)pyrene	mg/kg	NA	8.51E-02	ND				ND				ND				ND			
Benzo(b)fluoranthene	mg/kg	NA	8.51E-01	ND				ND				ND				ND			
Benzo(ghi)perylene	mg/kg	NA	2.32E+02	ND				ND				ND				ND			
Benzo(k)fluoranthene	mg/kg	NA	8.51E+00	ND				ND				ND				ND			
Carbazole	mg/kg	NA	3.11E+01	ND				ND				ND				ND			
Chrysene	mg/kg	NA	8.61E+01	ND				ND				ND				ND			
Di-n-butyl phthalate	mg/kg	NA	7.80E+02	ND				ND				2.70E-01	B			ND			
Fluoranthene	mg/kg	NA	3.09E+02	ND				ND				ND				ND			
Fluorene	mg/kg	NA	3.09E+02	ND				ND				ND				ND			
Indeno(1,2,3-cd)pyrene	mg/kg	NA	8.51E-01	ND				ND				ND				ND			
Phenanthrene	mg/kg	NA	2.32E+03	ND				ND				ND				ND			
Pyrene	mg/kg	NA	2.33E+02	ND				ND				ND				ND			
bis(2-Ethylhexyl)phthalate	mg/kg	NA	4.52E+01	ND				4.90E-02	B			8.70E-02	B			ND			
DIOXINS																			
1,2,3,4,6,7,8-Heptachlorodibenzo-p-Dioxin	mg/kg	NA	4.20E-04	1.10E-06	J			1.40E-06	J			NR				NR			
Heptachlorodibenzo-p-Dioxin	mg/kg	NA	NA	4.20E-06	J			4.00E-06	J			NR				NR			
Hexachlorodibenzo-p-Dioxin	mg/kg	NA	NA	3.60E-07	J			4.80E-07	J			NR				NR			
Octachlorodibenzo-p-Dioxin	mg/kg	NA	4.20E-03	8.00E-05				1.00E-04				NR				NR			

Table 5-2

Subsurface Soil Analytical Results
DEH Compound, Parcels 64(7) and 1(7)
Fort McClellan, Calhoun County, Alabama

Parcel Sample Location Sample Number Sample Date Sample Depth (Feet)				FTA-64 FTA-64-GP05 EA0011 13-Oct-98 8-12				FTA-64 FTA-64-GP06 EA0013 13-Oct-98 5-9				FTA-64 FTA-64-GP07 EA0015 12-Oct-98 8-12				FTA-64 FTA-64-GP08 EA0017 12-Oct-98 5-9			
Parameter	**Units**	**BKG[a]**	**SSSL[b]**	**Result**	**Qual**	**>BKG**	**>SSSL**	**Result**	**Qual**	**>BKG**	**>SSSL**	**Result**	**Qual**	**>BKG**	**>SSSL**	**Result**	**Qual**	**>BKG**	**>SSSL**
METALS																			
Aluminum	mg/kg	1.36E+04	7.80E+03	9.17E+03			YES	1.02E+04			YES	9.36E+03			YES	7.55E+03			
Arsenic	mg/kg	1.83E+01	4.26E-01	2.10E+00			YES	3.60E+00			YES	2.90E+00			YES	2.80E+00			YES
Barium	mg/kg	2.34E+02	5.47E+02	7.12E+01				5.23E+01				7.76E+01				6.85E+01			
Beryllium	mg/kg	8.60E-01	9.60E+00	1.20E+00		YES		9.60E-01		YES		8.70E-01		YES		8.10E-01			
Cadmium	mg/kg	2.20E-01	6.25E+00	ND				ND				ND				ND			
Calcium	mg/kg	6.37E+02	NA	ND				5.76E+02				9.47E+02		YES		5.81E+02			
Chromium	mg/kg	3.83E+01	2.32E+01	1.18E+01				1.66E+01				1.44E+01				1.18E+01			
Cobalt	mg/kg	1.75E+01	4.68E+02	6.20E+00	J			1.58E+01	J			ND				8.00E+00			
Copper	mg/kg	1.94E+01	3.13E+02	9.30E+00				2.07E+01		YES		1.98E+01		YES		1.22E+01			
Iron	mg/kg	4.48E+04	2.34E+03	1.52E+04			YES	2.61E+04			YES	2.06E+04			YES	1.69E+04			YES
Lead	mg/kg	3.85E+01	4.00E+02	8.10E+00				1.14E+01				1.49E+01				1.11E+01			
Magnesium	mg/kg	7.66E+02	NA	9.30E+02		YES		2.88E+03		YES		3.03E+03		YES		9.41E+02		YES	
Manganese	mg/kg	1.36E+03	3.63E+02	9.94E+01	J			1.69E+02	J			1.19E+02				3.52E+02			
Mercury	mg/kg	7.00E-02	2.33E+00	ND				ND				ND				ND			
Nickel	mg/kg	1.29E+01	1.54E+02	7.20E+00				1.48E+01		YES		1.10E+01				7.80E+00			
Potassium	mg/kg	7.11E+02	NA	6.62E+02				7.10E+02				6.77E+02				ND			
Selenium	mg/kg	4.70E-01	3.91E+01	7.50E-01		YES		ND				8.20E-01		YES		9.10E-01		YES	
Vanadium	mg/kg	6.49E+01	5.31E+01	8.50E+00				ND				ND				ND			
Zinc	mg/kg	3.49E+01	2.34E+03	1.96E+01				5.15E+01		YES		4.37E+01		YES		2.64E+01			
VOLATILE ORGANIC COMPOUNDS																			
2-Butanone	mg/kg	NA	4.66E+03	ND				ND				4.30E-03	B			ND			
Acetone	mg/kg	NA	7.76E+02	4.40E-02	B			9.30E-03	B			2.70E-02	B			3.20E-02	B		
Carbon disulfide	mg/kg	NA	7.77E+02	8.70E-03	J			ND				ND				ND			
Methylene chloride	mg/kg	NA	8.41E+01	2.10E-03	B			2.00E-03	B			2.00E-03	B			2.70E-03	B		
Trichloroethene	mg/kg	NA	5.72E+01	ND				ND				ND				ND			
cis-1,2-Dichloroethene	mg/kg	NA	7.77E+01	ND				ND				ND				ND			

Table 5-2

Subsurface Soil Analytical Results
DEH Compound, Parcels 64(7) and 1(7)
Fort McClellan, Calhoun County, Alabama

Parcel				FTA-64				FTA-64				FTA-64				FTA-64			
Sample Location				FTA-64-GP05				FTA-64-GP06				FTA-64-GP07				FTA-64-GP08			
Sample Number				EA0011				EA0013				EA0015				EA0017			
Sample Date				13-Oct-98				13-Oct-98				12-Oct-98				12-Oct-98			
Sample Depth (Feet)				8-12				5-9				8-12				5-9			
Parameter	**Units**	**BKG[a]**	**SSSL[b]**	**Result**	**Qual**	**>BKG**	**>SSSL**	**Result**	**Qual**	**>BKG**	**>SSSL**	**Result**	**Qual**	**>BKG**	**>SSSL**	**Result**	**Qual**	**>BKG**	**>SSSL**
SEMIVOLATILE ORGANIC COMPOUNDS																			
Acenaphthene	mg/kg	NA	4.63E+02	ND				ND				ND				7.50E-02	J		
Anthracene	mg/kg	NA	2.33E+03	ND				ND				ND				9.60E-02	J		
Benzo(a)anthracene	mg/kg	NA	8.51E-01	ND				ND				ND				1.70E-01	J		
Benzo(a)pyrene	mg/kg	NA	8.51E-02	ND				ND				ND				1.30E-01	J		YES
Benzo(b)fluoranthene	mg/kg	NA	8.51E-01	ND				ND				ND				1.30E-01	J		
Benzo(ghi)perylene	mg/kg	NA	2.32E+02	ND				ND				ND				6.40E-02	J		
Benzo(k)fluoranthene	mg/kg	NA	8.51E+00	ND				ND				ND				1.40E-01	J		
Carbazole	mg/kg	NA	3.11E+01	ND				ND				ND				7.60E-02	J		
Chrysene	mg/kg	NA	8.61E+01	ND				ND				ND				1.70E-01	J		
Di-n-butyl phthalate	mg/kg	NA	7.80E+02	ND				ND				ND				ND			
Fluoranthene	mg/kg	NA	3.09E+02	ND				ND				ND				4.30E-01			
Fluorene	mg/kg	NA	3.09E+02	ND				ND				ND				6.20E-02	J		
Indeno(1,2,3-cd)pyrene	mg/kg	NA	8.51E-01	ND				ND				ND				6.80E-02	J		
Phenanthrene	mg/kg	NA	2.32E+03	ND				ND				ND				4.40E-01			
Pyrene	mg/kg	NA	2.33E+02	ND				ND				ND				3.30E-01	J		
bis(2-Ethylhexyl)phthalate	mg/kg	NA	4.52E+01	ND				5.50E-02	B			5.90E-02	B			ND			
DIOXINS																			
1,2,3,4,6,7,8-Heptachlorodibenzo-p-Dioxin	mg/kg	NA	4.20E-04	NR				NR				NR				NR			
Heptachlorodibenzo-p-Dioxin	mg/kg	NA	NA	NR				NR				NR				NR			
Hexachlorodibenzo-p-Dioxin	mg/kg	NA	NA	NR				NR				NR				NR			
Octachlorodibenzo-p-Dioxin	mg/kg	NA	4.20E-03	NR				NR				NR				NR			

Table 5-2

Subsurface Soil Analytical Results
DEH Compound, Parcels 64(7) and 1(7)
Fort McClellan, Calhoun County, Alabama

Parcel Sample Location Sample Number Sample Date Sample Depth (Feet)				FTA-64 FTA-64-GP09 EA0018 12-Oct-98 5-9				FTA-64 FTA-64-GP10 EA0019 12-Oct-98 5-7				FTA-64 FTA-64-GP11 EA0020 12-Oct-98 4-8				FTA-64 FTA-64-GP12 EA0021 13-Oct-98 4-8			
Parameter	**Units**	**BKG[a]**	**SSSL[b]**	**Result**	**Qual**	**>BKG**	**>SSSL**	**Result**	**Qual**	**>BKG**	**>SSSL**	**Result**	**Qual**	**>BKG**	**>SSSL**	**Result**	**Qual**	**>BKG**	**>SSSL**
METALS																			
Aluminum	mg/kg	1.36E+04	7.80E+03	1.05E+04			YES	1.89E+04		YES	YES	8.66E+03			YES	1.28E+04			YES
Arsenic	mg/kg	1.83E+01	4.26E-01	2.80E+00			YES	4.80E+00			YES	3.60E+00			YES	5.40E+00			YES
Barium	mg/kg	2.34E+02	5.47E+02	6.52E+01				4.10E+01				2.90E+01				1.38E+02			
Beryllium	mg/kg	8.60E-01	9.60E+00	7.20E-01				1.10E+00		YES		8.00E-01				1.40E+00		YES	
Cadmium	mg/kg	2.20E-01	6.25E+00	ND				ND				ND				ND			
Calcium	mg/kg	6.37E+02	NA	9.17E+02		YES		1.43E+03		YES		7.93E+02		YES		8.72E+02		YES	
Chromium	mg/kg	3.83E+01	2.32E+01	1.53E+01				2.76E+01			YES	1.62E+01				2.05E+01			
Cobalt	mg/kg	1.75E+01	4.68E+02	ND				1.53E+01				9.70E+00				2.37E+01	J	YES	
Copper	mg/kg	1.94E+01	3.13E+02	1.72E+01				5.30E+01		YES		3.22E+01		YES		4.39E+01		YES	
Iron	mg/kg	4.48E+04	2.34E+03	2.03E+04			YES	4.61E+04		YES	YES	2.37E+04			YES	3.41E+04			YES
Lead	mg/kg	3.85E+01	4.00E+02	1.00E+01				2.04E+01				1.21E+01				1.37E+01			
Magnesium	mg/kg	7.66E+02	NA	1.34E+03		YES		9.68E+03		YES		3.72E+03		YES		4.50E+03		YES	
Manganese	mg/kg	1.36E+03	3.63E+02	5.56E+01				2.01E+02				1.89E+02				5.51E+02	J		YES
Mercury	mg/kg	7.00E-02	2.33E+00	ND				ND				ND				ND			
Nickel	mg/kg	1.29E+01	1.54E+02	8.60E+00				5.30E+01		YES		2.61E+01		YES		3.25E+01		YES	
Potassium	mg/kg	7.11E+02	NA	7.20E+02		YES		6.74E+02				7.15E+02		YES		9.26E+02		YES	
Selenium	mg/kg	4.70E-01	3.91E+01	9.10E-01		YES		1.50E+00		YES		5.70E-01		YES		1.10E+00		YES	
Vanadium	mg/kg	6.49E+01	5.31E+01	7.90E+00				ND				ND				ND			
Zinc	mg/kg	3.49E+01	2.34E+03	3.22E+01				1.47E+02		YES		7.41E+01		YES		8.93E+01		YES	
VOLATILE ORGANIC COMPOUNDS																			
2-Butanone	mg/kg	NA	4.66E+03	5.00E-03	B			ND				ND				ND			
Acetone	mg/kg	NA	7.76E+02	4.40E-02	B			7.00E-03	B			7.70E-03	B			1.00E-02	B		
Carbon disulfide	mg/kg	NA	7.77E+02	ND				ND				ND				ND			
Methylene chloride	mg/kg	NA	8.41E+01	2.90E-03	B			2.80E-03	B			2.50E-03	B			2.30E-03	B		
Trichloroethene	mg/kg	NA	5.72E+01	ND				ND				ND				ND			
cis-1,2-Dichloroethene	mg/kg	NA	7.77E+01	ND				ND				ND				ND			

Table 5-2

Subsurface Soil Analytical Results
DEH Compound, Parcels 64(7) and 1(7)
Fort McClellan, Calhoun County, Alabama

Parcel Sample Location Sample Number Sample Date Sample Depth (Feet)				FTA-64 FTA-64-GP09 EA0018 12-Oct-98 5-9				FTA-64 FTA-64-GP10 EA0019 12-Oct-98 5-7				FTA-64 FTA-64-GP11 EA0020 12-Oct-98 4-8				FTA-64 FTA-64-GP12 EA0021 13-Oct-98 4-8			
Parameter	**Units**	**BKG[a]**	**SSSL[b]**	**Result**	**Qual**	**>BKG**	**>SSSL**	**Result**	**Qual**	**>BKG**	**>SSSL**	**Result**	**Qual**	**>BKG**	**>SSSL**	**Result**	**Qual**	**>BKG**	**>SSSL**
SEMIVOLATILE ORGANIC COMPOUNDS																			
Acenaphthene	mg/kg	NA	4.63E+02	ND				ND				ND				ND			
Anthracene	mg/kg	NA	2.33E+03	ND				ND				ND				ND			
Benzo(a)anthracene	mg/kg	NA	8.51E-01	ND				ND				ND				ND			
Benzo(a)pyrene	mg/kg	NA	8.51E-02	ND				ND				ND				ND			
Benzo(b)fluoranthene	mg/kg	NA	8.51E-01	ND				ND				ND				ND			
Benzo(ghi)perylene	mg/kg	NA	2.32E+02	ND				ND				ND				ND			
Benzo(k)fluoranthene	mg/kg	NA	8.51E+00	ND				ND				ND				ND			
Carbazole	mg/kg	NA	3.11E+01	ND				ND				ND				ND			
Chrysene	mg/kg	NA	8.61E+01	ND				ND				ND				ND			
Di-n-butyl phthalate	mg/kg	NA	7.80E+02	ND				ND				ND				2.40E-01	B		
Fluoranthene	mg/kg	NA	3.09E+02	ND				ND				ND				ND			
Fluorene	mg/kg	NA	3.09E+02	ND				ND				ND				ND			
Indeno(1,2,3-cd)pyrene	mg/kg	NA	8.51E-01	ND				ND				ND				ND			
Phenanthrene	mg/kg	NA	2.32E+03	ND				ND				ND				ND			
Pyrene	mg/kg	NA	2.33E+02	ND				ND				ND				ND			
bis(2-Ethylhexyl)phthalate	mg/kg	NA	4.52E+01	ND				ND				ND				7.60E-02	B		
DIOXINS																			
1,2,3,4,6,7,8-Heptachlorodibenzo-p-Dioxin	mg/kg	NA	4.20E-04	NR				NR				NR				NR			
Heptachlorodibenzo-p-Dioxin	mg/kg	NA	NA	NR				NR				NR				NR			
Hexachlorodibenzo-p-Dioxin	mg/kg	NA	NA	NR				NR				NR				NR			
Octachlorodibenzo-p-Dioxin	mg/kg	NA	4.20E-03	NR				NR				NR				NR			

Table 5-2

Subsurface Soil Analytical Results
DEH Compound, Parcels 64(7) and 1(7)
Fort McClellan, Calhoun County, Alabama

Parcel Sample Location Sample Number Sample Date Sample Depth (Feet)				FTA-64 FTA-64-GP13 EA0022 13-Oct-98 4-8				FTA-64 FTA-64-GP14 EA0024 12-Oct-98 1-5				FTA-64 FTA-64-GP15 EA0026 3-Nov-98 8-12			
Parameter	**Units**	**BKG[a]**	**SSSL[b]**	**Result**	**Qual**	**>BKG**	**>SSSL**	**Result**	**Qual**	**>BKG**	**>SSSL**	**Result**	**Qual**	**>BKG**	**>SSSL**
METALS															
Aluminum	mg/kg	1.36E+04	7.80E+03	1.95E+04		YES	YES	1.03E+04			YES	1.40E+04		YES	YES
Arsenic	mg/kg	1.83E+01	4.26E-01	2.40E+00			YES	4.70E+00			YES	6.40E+00			YES
Barium	mg/kg	2.34E+02	5.47E+02	7.64E+01				5.84E+01				5.06E+01			
Beryllium	mg/kg	8.60E-01	9.60E+00	9.30E-01		YES		1.00E+00		YES		1.40E+00		YES	
Cadmium	mg/kg	2.20E-01	6.25E+00	ND				ND				8.30E-01		YES	
Calcium	mg/kg	6.37E+02	NA	1.69E+03		YES		ND				1.21E+03		YES	
Chromium	mg/kg	3.83E+01	2.32E+01	2.89E+01			YES	1.86E+01				2.29E+01			
Cobalt	mg/kg	1.75E+01	4.68E+02	1.85E+01	J	YES		8.30E+00				1.69E+01			
Copper	mg/kg	1.94E+01	3.13E+02	4.65E+01		YES		3.11E+01		YES		4.62E+01		YES	
Iron	mg/kg	4.48E+04	2.34E+03	4.11E+04			YES	3.33E+04			YES	3.77E+04			YES
Lead	mg/kg	3.85E+01	4.00E+02	2.25E+01				1.45E+01				1.83E+01			
Magnesium	mg/kg	7.66E+02	NA	1.04E+04		YES		1.44E+03		YES		6.55E+03		YES	
Manganese	mg/kg	1.36E+03	3.63E+02	3.59E+02	J			5.43E+01				2.92E+02			
Mercury	mg/kg	7.00E-02	2.33E+00	ND				ND				4.20E-02			
Nickel	mg/kg	1.29E+01	1.54E+02	3.95E+01		YES		1.05E+01				4.89E+01		YES	
Potassium	mg/kg	7.11E+02	NA	7.48E+02		YES		7.02E+02				7.54E+02		YES	
Selenium	mg/kg	4.70E-01	3.91E+01	9.80E-01		YES		9.10E-01		YES		1.90E+00		YES	
Vanadium	mg/kg	6.49E+01	5.31E+01	7.00E+00				8.30E+00				ND			
Zinc	mg/kg	3.49E+01	2.34E+03	1.16E+02		YES		5.28E+01		YES		1.26E+02		YES	
VOLATILE ORGANIC COMPOUNDS															
2-Butanone	mg/kg	NA	4.66E+03	ND				ND				5.60E-03	B		
Acetone	mg/kg	NA	7.76E+02	ND				1.50E-02	B			2.50E-02	B		
Carbon disulfide	mg/kg	NA	7.77E+02	ND				ND				ND			
Methylene chloride	mg/kg	NA	8.41E+01	2.20E-03	B			2.30E-03	B			4.60E-03	B		
Trichloroethene	mg/kg	NA	5.72E+01	ND				ND				1.70E-03	J		
cis-1,2-Dichloroethene	mg/kg	NA	7.77E+01	ND				ND				5.30E-03	J		

Table 5-2

Subsurface Soil Analytical Results
DEH Compound, Parcels 64(7) and 1(7)
Fort McClellan, Calhoun County, Alabama

Parcel Sample Location Sample Number Sample Date Sample Depth (Feet)				FTA-64 FTA-64-GP13 EA0022 13-Oct-98 4-8				FTA-64 FTA-64-GP14 EA0024 12-Oct-98 1-5				FTA-64 FTA-64-GP15 EA0026 3-Nov-98 8-12			
Parameter	**Units**	**BKG[a]**	**SSSL[b]**	**Result**	**Qual**	**>BKG**	**>SSSL**	**Result**	**Qual**	**>BKG**	**>SSSL**	**Result**	**Qual**	**>BKG**	**>SSSL**
SEMIVOLATILE ORGANIC COMPOUNDS															
Acenaphthene	mg/kg	NA	4.63E+02	ND				ND				ND			
Anthracene	mg/kg	NA	2.33E+03	ND				ND				ND			
Benzo(a)anthracene	mg/kg	NA	8.51E-01	ND				ND				ND			
Benzo(a)pyrene	mg/kg	NA	8.51E-02	ND				ND				ND			
Benzo(b)fluoranthene	mg/kg	NA	8.51E-01	ND				ND				ND			
Benzo(ghi)perylene	mg/kg	NA	2.32E+02	ND				ND				ND			
Benzo(k)fluoranthene	mg/kg	NA	8.51E+00	ND				ND				ND			
Carbazole	mg/kg	NA	3.11E+01	ND				ND				ND			
Chrysene	mg/kg	NA	8.61E+01	ND				ND				ND			
Di-n-butyl phthalate	mg/kg	NA	7.80E+02	5.10E-02	J			ND				ND			
Fluoranthene	mg/kg	NA	3.09E+02	ND				ND				ND			
Fluorene	mg/kg	NA	3.09E+02	ND				ND				ND			
Indeno(1,2,3-cd)pyrene	mg/kg	NA	8.51E-01	ND				ND				ND			
Phenanthrene	mg/kg	NA	2.32E+03	ND				ND				ND			
Pyrene	mg/kg	NA	2.33E+02	ND				ND				ND			
bis(2-Ethylhexyl)phthalate	mg/kg	NA	4.52E+01	4.40E-02	B			4.90E-02	B			1.10E-01	B		
DIOXINS															
1,2,3,4,6,7,8-Heptachlorodibenzo-p-Dioxin	mg/kg	NA	4.20E-04	NR				NR				NR			
Heptachlorodibenzo-p-Dioxin	mg/kg	NA	NA	NR				NR				NR			
Hexachlorodibenzo-p-Dioxin	mg/kg	NA	NA	NR				NR				NR			
Octachlorodibenzo-p-Dioxin	mg/kg	NA	4.20E-03	NR				NR				NR			

Analyses performed by Quanterra Environmental Services using U.S. Environmental Protection Agency (EPA) SW-846 analytical methods, including Update III methods where applicable.

[a] Bkg - Background. Concentration listed is two times (2x) the arithmetic mean of background metals concentration given in Science Applications International Corporation (1998), *Final Background Metals Survey Report, Fort McClellan, Alabama,* July.

[b] Residential human health site-specific screening level (SSSL) as given in IT Corporation (2000), *Final Human Health and Ecological Screening Values and PAH Background Summary Report, Fort McClellan, Calhoun County, Alabama,* July.

B - Analyte detected in laboratory or field blank at concentration greater than the reporting limit (and greater than zero).
J - Result is greater than method detection limit but less than or equal to reporting limit.
mg/kg - Milligrams per kilogram.
NA - Not available.
ND - Not detected.
NR - Analysis not requested.
Qual - Data validation qualifier.

Table 5-3

Groundwater Analytical Results
DEH Compound, Parcels 64(7) and 1(7)
Fort McClellan, Calhoun County, Alabama

Parcel Sample Location Sample Number Sample Date				FTA-64 FTA-64-GP01 EA3001R 20-Jul-00				FTA-64 FTA-64-GP02 EA3002 25-Jan-99				FTA-64 FTA-64-GP03 EA3005R 8-Sep-00				FTA-64 FTA-64-GP04 EA3006 21-Jan-99			
Parameter	**Units**	**BKG[a]**	**SSSL[b]**	**Result**	**Qual**	**>BKG**	**>SSSL**	**Result**	**Qual**	**>BKG**	**>SSSL**	**Result**	**Qual**	**>BKG**	**>SSSL**	**Result**	**Qual**	**>BKG**	**>SSSL**
METALS																			
Aluminum	mg/L	2.34E+00	1.56E+00	1.78E-01	B			7.17E+00	J	YES	YES	1.03E+00	J			5.29E-01	J		
Antimony	mg/L	3.19E-03	6.20E-04	ND				8.70E-03	J	YES	YES	ND				ND			
Arsenic	mg/L	1.78E-02	4.00E-05	3.20E-03	J		YES	5.40E-03	J		YES	ND				ND			
Barium	mg/L	1.27E-01	1.10E-01	8.43E-02	J			2.40E-01	J	YES	YES	7.33E-02	J			3.10E-02	J		
Beryllium	mg/L	1.24E-03	3.12E-03	ND				6.20E-04	B			ND				ND			
Calcium	mg/L	5.65E+01	NA	7.55E+01		YES		1.57E+02	J	YES		1.06E+02		YES		1.66E+02		YES	
Chromium	mg/L	NA	4.69E-03	ND				1.05E-02	J		YES	3.40E-03	J			ND			
Cobalt	mg/L	2.34E-02	9.39E-02	4.90E-03	J			1.15E-02	J			2.70E-03	J			ND			
Copper	mg/L	2.55E-02	6.26E-02	ND				1.80E-03	B			ND				ND			
Iron	mg/L	7.04E+00	4.69E-01	1.04E+01		YES	YES	9.83E+00	J	YES	YES	1.25E+00			YES	3.90E+00			YES
Lead	mg/L	7.99E-03	1.50E-02	ND				8.20E-03	J	YES		ND				ND			
Magnesium	mg/L	2.13E+01	NA	6.04E+01		YES		7.84E+01	J	YES		9.86E+01		YES		9.50E+01		YES	
Manganese	mg/L	5.81E-01	7.35E-02	5.34E+00		YES	YES	4.61E-01	J		YES	2.58E+00		YES	YES	1.54E+00		YES	YES
Mercury	mg/L	NA	4.60E-04	1.10E-04	B			ND				ND				ND			
Nickel	mg/L	NA	3.13E-02	ND				1.72E-02	B			7.40E-03	J			ND			
Potassium	mg/L	7.20E+00	NA	6.68E+00				1.53E+01	J	YES		8.74E+00	J	YES		2.21E+00	J		
Sodium	mg/L	1.48E+01	NA	7.46E+01		YES		9.37E+01		YES		7.54E+01		YES		4.73E+01		YES	
Thallium	mg/L	1.45E-03	1.00E-04	7.90E-03	J	YES	YES	ND				9.50E-03	J	YES	YES	ND			
Vanadium	mg/L	1.70E-02	1.10E-02	ND				1.29E-02	J		YES	ND				3.82E-02	J	YES	YES
Zinc	mg/L	2.20E-01	4.69E-01	ND				2.30E-02	J			ND				ND			
VOLATILE ORGANIC COMPOUNDS																			
1,2,3-Trichlorobenzene	mg/L	NA	1.32E-03	ND				ND				1.30E-04	J			ND			
1,2,4-Trichlorobenzene	mg/L	NA	1.35E-02	ND				ND				2.90E-04	J			ND			
2-Butanone	mg/L	NA	7.14E-01	6.90E-03	J			ND				ND				ND			
2-Hexanone	mg/L	NA	4.93E-03	2.30E-03	J			ND				ND				ND			
Acetone	mg/L	NA	1.56E-01	2.60E-02	J			ND				2.60E-03	B			ND			
Bromomethane	mg/L	NA	2.17E-03	ND				ND				ND				ND			
Carbon disulfide	mg/L	NA	1.51E-01	ND				ND				ND				ND			
Hexachlorobutadiene	mg/L	NA	8.30E-04	ND				ND				ND				ND			
Vinyl chloride	mg/L	NA	3.00E-05	ND				ND				ND				ND			
cis-1,2-Dichloroethene	mg/L	NA	1.55E-02	ND				ND				ND				7.90E-04	J		
p-Cymene	mg/L	NA	2.26E-01	ND				ND				ND				ND			
SEMIVOLATILE ORGANIC COMPOUNDS																			
Di-n-butyl phthalate	mg/L	NA	1.48E-01	ND				ND				ND				ND			
Diethyl phthalate	mg/L	NA	1.23E+00	ND				ND				1.10E-03	B			ND			
Phenol	mg/L	NA	9.31E-01	ND				ND				ND				ND			

Table 5-3

Groundwater Analytical Results
DEH Compound, Parcels 64(7) and 1(7)
Fort McClellan, Calhoun County, Alabama

Parcel / Sample Location / Sample Number / Sample Date				FTA-64 / FTA-64-GP06 / EA3010 / 20-Jan-99				FTA-64 / FTA-64-GP07 / EA3011 / 23-Oct-98				FTA-64 / FTA-64-GP08 / EA3012 / 18-Jan-99				FTA-64 / FTA-64-GP09 / EA3013 / 23-Oct-98			
Parameter	Units	BKG[a]	SSSL[b]	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL
METALS																			
Aluminum	mg/L	2.34E+00	1.56E+00	5.02E+00	J	YES	YES	4.25E+01		YES	YES	4.40E+01	J	YES	YES	5.06E+00		YES	YES
Antimony	mg/L	3.19E-03	6.20E-04	ND				ND				ND				ND			
Arsenic	mg/L	1.78E-02	4.00E-05	ND				ND				5.20E-03	J		YES	ND			
Barium	mg/L	1.27E-01	1.10E-01	5.49E-02	J			4.32E-01		YES	YES	5.38E-01		YES	YES	ND			
Beryllium	mg/L	1.24E-03	3.12E-03	ND				ND				1.70E-03	B	YES		ND			
Calcium	mg/L	5.65E+01	NA	1.22E+02		YES		1.05E+02		YES		2.47E+01				1.34E+02		YES	
Chromium	mg/L	NA	4.69E-03	4.60E-03	J			4.74E-02			YES	8.60E-02			YES	1.54E-02			YES
Cobalt	mg/L	2.34E-02	9.39E-02	1.00E-02	J			ND				2.01E-02	J			ND			
Copper	mg/L	2.55E-02	6.26E-02	5.60E-03	J			3.40E-02		YES		2.32E-02	J			ND			
Iron	mg/L	7.04E+00	4.69E-01	5.91E+00			YES	6.02E+01		YES	YES	3.66E+01		YES	YES	1.33E+01		YES	YES
Lead	mg/L	7.99E-03	1.50E-02	2.40E-03	J			2.60E-02		YES	YES	1.32E-02		YES		6.20E-03			
Magnesium	mg/L	2.13E+01	NA	9.16E+01		YES		4.68E+01		YES		2.43E+01		YES		6.95E+01		YES	
Manganese	mg/L	5.81E-01	7.35E-02	1.05E+00		YES	YES	2.99E+00		YES	YES	2.60E-01			YES	3.12E+00		YES	YES
Mercury	mg/L	NA	4.60E-04	ND				ND				ND				ND			
Nickel	mg/L	NA	3.13E-02	2.03E-02	J			4.10E-02			YES	5.49E-02			YES	ND			
Potassium	mg/L	7.20E+00	NA	3.17E+00	J			7.72E+00		YES		1.82E+01		YES		ND			
Sodium	mg/L	1.48E+01	NA	7.73E+01		YES		4.22E+01		YES		1.34E+02		YES		6.03E+01		YES	
Thallium	mg/L	1.45E-03	1.00E-04	ND				ND				4.70E-03	J	YES	YES	ND			
Vanadium	mg/L	1.70E-02	1.10E-02	4.27E-02	J	YES	YES	5.05E-02		YES	YES	6.53E-02		YES	YES	ND			
Zinc	mg/L	2.20E-01	4.69E-01	2.67E-02	B			9.84E-02	B			8.20E-02	B			2.77E-02	B		
VOLATILE ORGANIC COMPOUNDS																			
1,2,3-Trichlorobenzene	mg/L	NA	1.32E-03	ND				ND				ND				ND			
1,2,4-Trichlorobenzene	mg/L	NA	1.35E-02	ND				ND				ND				ND			
2-Butanone	mg/L	NA	7.14E-01	ND				ND				ND				1.20E-02	J		
2-Hexanone	mg/L	NA	4.93E-03	ND				ND				ND				ND			
Acetone	mg/L	NA	1.56E-01	1.20E-03	B			1.20E-03	B			5.00E-03	B			3.10E-02	B		
Bromomethane	mg/L	NA	2.17E-03	ND				1.90E-04	B			ND				ND			
Carbon disulfide	mg/L	NA	1.51E-01	ND				ND				1.70E-04	J			1.60E-03			
Hexachlorobutadiene	mg/L	NA	8.30E-04	ND				2.60E-04	B			ND				1.50E-04	B		
Vinyl chloride	mg/L	NA	3.00E-05	ND				4.30E-04	J		YES	ND				ND			
cis-1,2-Dichloroethene	mg/L	NA	1.55E-02	ND				7.00E-04	J			ND				ND			
p-Cymene	mg/L	NA	2.26E-01	ND				ND				ND				1.30E-02			
SEMIVOLATILE ORGANIC COMPOUNDS																			
Di-n-butyl phthalate	mg/L	NA	1.48E-01	ND				ND				8.40E-03	J			ND			
Diethyl phthalate	mg/L	NA	1.23E+00	ND				ND				ND				ND			
Phenol	mg/L	NA	9.31E-01	ND				5.40E-03	B			ND				4.90E-03	B		

Table 5-3

Groundwater Analytical Results
DEH Compound, Parcels 64(7) and 1(7)
Fort McClellan, Calhoun County, Alabama

Parcel / Sample Location / Sample Number / Sample Date				FTA-64 / FTA-64-GP09 / EA3013R / 20-Jul-00				FTA-64 / FTA-64-GP10 / EA3014 / 18-Jan-99				FTA-64 / FTA-64-GP11 / EA3015 / 18-Jan-99				FTA-64 / FTA-64-GP12 / EA3016 / 21-Jan-99			
Parameter	**Units**	**BKG[a]**	**SSSL[b]**	**Result**	**Qual**	**>BKG**	**>SSSL**	**Result**	**Qual**	**>BKG**	**>SSSL**	**Result**	**Qual**	**>BKG**	**>SSSL**	**Result**	**Qual**	**>BKG**	**>SSSL**
METALS																			
Aluminum	mg/L	2.34E+00	1.56E+00	5.64E-01	B			5.25E+00	J	YES	YES	5.02E+00	J	YES	YES	8.78E+00	J	YES	YES
Antimony	mg/L	3.19E-03	6.20E-04	ND				ND				ND				ND			
Arsenic	mg/L	1.78E-02	4.00E-05	ND				ND				ND				ND			
Barium	mg/L	1.27E-01	1.10E-01	2.82E-02	J			6.18E-02	J			5.53E-02	J			9.17E-02	J		
Beryllium	mg/L	1.24E-03	3.12E-03	ND				ND				ND				ND			
Calcium	mg/L	5.65E+01	NA	2.54E+02		YES		1.57E+02		YES		1.98E+02		YES		1.02E+02		YES	
Chromium	mg/L	NA	4.69E-03	ND				1.00E-02			YES	6.00E-03	J		YES	1.29E-02			YES
Cobalt	mg/L	2.34E-02	9.39E-02	ND				ND				ND				6.10E-03	J		
Copper	mg/L	2.55E-02	6.26E-02	ND				6.30E-03	J			6.30E-03	J			1.17E-02	J		
Iron	mg/L	7.04E+00	4.69E-01	1.24E+00			YES	7.90E+00		YES	YES	6.33E+00			YES	1.07E+01		YES	YES
Lead	mg/L	7.99E-03	1.50E-02	ND				3.40E-03				3.30E-03				5.20E-03			
Magnesium	mg/L	2.13E+01	NA	1.71E+02		YES		1.12E+02		YES		1.76E+02		YES		8.09E+01		YES	
Manganese	mg/L	5.81E-01	7.35E-02	7.15E-01		YES	YES	6.86E-01		YES	YES	4.02E-01			YES	6.87E-01		YES	YES
Mercury	mg/L	NA	4.60E-04	1.10E-04	B			ND				ND				ND			
Nickel	mg/L	NA	3.13E-02	ND				1.74E-02	J			1.24E-02	J			1.52E-02	J		
Potassium	mg/L	7.20E+00	NA	6.60E+00				3.87E+00	J			3.15E+00	J			1.10E+01		YES	
Sodium	mg/L	1.48E+01	NA	8.55E+01		YES		6.77E+01		YES		7.64E+01		YES		5.05E+01		YES	
Thallium	mg/L	1.45E-03	1.00E-04	5.30E-03	J	YES	YES	4.30E-03	J	YES	YES	ND				ND			
Vanadium	mg/L	1.70E-02	1.10E-02	ND				5.08E-02		YES	YES	6.15E-02		YES	YES	4.29E-02	J	YES	YES
Zinc	mg/L	2.20E-01	4.69E-01	ND				2.26E-02	B			1.80E-02	B			2.07E-02	B		
VOLATILE ORGANIC COMPOUNDS																			
1,2,3-Trichlorobenzene	mg/L	NA	1.32E-03	ND				ND				ND				ND			
1,2,4-Trichlorobenzene	mg/L	NA	1.35E-02	ND				ND				ND				ND			
2-Butanone	mg/L	NA	7.14E-01	ND				ND				ND				ND			
2-Hexanone	mg/L	NA	4.93E-03	ND				ND				ND				ND			
Acetone	mg/L	NA	1.56E-01	ND				ND				ND				ND			
Bromomethane	mg/L	NA	2.17E-03	ND				ND				ND				ND			
Carbon disulfide	mg/L	NA	1.51E-01	ND				ND				ND				ND			
Hexachlorobutadiene	mg/L	NA	8.30E-04	ND				ND				ND				ND			
Vinyl chloride	mg/L	NA	3.00E-05	ND				ND				ND				ND			
cis-1,2-Dichloroethene	mg/L	NA	1.55E-02	ND				ND				ND				ND			
p-Cymene	mg/L	NA	2.26E-01	ND				ND				ND				ND			
SEMIVOLATILE ORGANIC COMPOUNDS																			
Di-n-butyl phthalate	mg/L	NA	1.48E-01	ND				3.80E-03	J			8.70E-03	J			ND			
Diethyl phthalate	mg/L	NA	1.23E+00	ND				ND				ND				ND			
Phenol	mg/L	NA	9.31E-01	ND				ND				ND				ND			

Table 5-3

Groundwater Analytical Results
DEH Compound, Parcels 64(7) and 1(7)
Fort McClellan, Calhoun County, Alabama

Parcel Sample Location Sample Number Sample Date				FTA-64 FTA-64-GP13 EA3017 20-Jan-99				FTA-64 FTA-64-GP14 EA3018 18-Jan-99				FTA-64 FTA-64-GP15 EA3007 20-Jan-99				FTA-64 FTA-64-MW01 EA3019 16-Nov-98			
Parameter	**Units**	**BKG[a]**	**SSSL[b]**	**Result**	**Qual**	**>BKG**	**>SSSL**	**Result**	**Qual**	**>BKG**	**>SSSL**	**Result**	**Qual**	**>BKG**	**>SSSL**	**Result**	**Qual**	**>BKG**	**>SSSL**
METALS																			
Aluminum	mg/L	2.34E+00	1.56E+00	4.59E+01	J	YES	YES	8.81E+00	J	YES	YES	2.63E+00	J	YES	YES	8.42E-01			
Antimony	mg/L	3.19E-03	6.20E-04	ND				ND				ND				ND			
Arsenic	mg/L	1.78E-02	4.00E-05	1.00E-02			YES	3.50E-03	J		YES	ND				ND			
Barium	mg/L	1.27E-01	1.10E-01	2.99E-01		YES	YES	5.20E-01		YES	YES	1.05E-01	J			ND			
Beryllium	mg/L	1.24E-03	3.12E-03	2.60E-03	B	YES		ND				ND				ND			
Calcium	mg/L	5.65E+01	NA	1.87E+02		YES		5.57E+01				2.40E+02		YES		2.93E+02		YES	
Chromium	mg/L	NA	4.69E-03	8.15E-02			YES	1.36E-02			YES	ND				ND			
Cobalt	mg/L	2.34E-02	9.39E-02	3.54E-02	J	YES		6.90E-03	J			6.10E-03	J			ND			
Copper	mg/L	2.55E-02	6.26E-02	4.61E-02		YES		9.00E-03	J			3.60E-03	J			ND			
Iron	mg/L	7.04E+00	4.69E-01	5.51E+01		YES	YES	1.64E+01		YES	YES	3.37E+00			YES	3.16E+00			YES
Lead	mg/L	7.99E-03	1.50E-02	2.60E-02		YES	YES	4.80E-03				ND				ND			
Magnesium	mg/L	2.13E+01	NA	1.46E+02		YES		2.02E+01				1.52E+02		YES		1.52E+02		YES	
Manganese	mg/L	5.81E-01	7.35E-02	7.01E-01		YES	YES	6.18E-01		YES	YES	1.47E+00		YES	YES	6.03E-01		YES	YES
Mercury	mg/L	NA	4.60E-04	ND				ND				7.50E-04			YES	ND			
Nickel	mg/L	NA	3.13E-02	7.88E-02			YES	1.58E-02	J			2.07E-02	J			ND			
Potassium	mg/L	7.20E+00	NA	2.04E+01		YES		4.71E+00	J			8.07E+00		YES		ND			
Sodium	mg/L	1.48E+01	NA	1.06E+02		YES		4.61E+01		YES		8.26E+01		YES		8.37E+01		YES	
Thallium	mg/L	1.45E-03	1.00E-04	4.50E-03	J	YES	YES	ND				ND				ND			
Vanadium	mg/L	1.70E-02	1.10E-02	9.19E-02		YES	YES	1.92E-02	J	YES	YES	6.18E-02		YES	YES	6.62E-02		YES	YES
Zinc	mg/L	2.20E-01	4.69E-01	1.12E-01	B			2.71E-02	B			1.28E-02	B			ND			
VOLATILE ORGANIC COMPOUNDS																			
1,2,3-Trichlorobenzene	mg/L	NA	1.32E-03	ND				ND				ND				ND			
1,2,4-Trichlorobenzene	mg/L	NA	1.35E-02	ND				ND				ND				ND			
2-Butanone	mg/L	NA	7.14E-01	ND				ND				ND				ND			
2-Hexanone	mg/L	NA	4.93E-03	ND				ND				ND				ND			
Acetone	mg/L	NA	1.56E-01	ND				ND				1.10E-03	B			ND			
Bromomethane	mg/L	NA	2.17E-03	ND				ND				ND				ND			
Carbon disulfide	mg/L	NA	1.51E-01	ND				1.80E-04	J			ND				ND			
Hexachlorobutadiene	mg/L	NA	8.30E-04	ND				ND				ND				ND			
Vinyl chloride	mg/L	NA	3.00E-05	ND				1.60E-04	J		YES	ND				ND			
cis-1,2-Dichloroethene	mg/L	NA	1.55E-02	ND				ND				ND				ND			
p-Cymene	mg/L	NA	2.26E-01	ND				ND				ND				ND			
SEMIVOLATILE ORGANIC COMPOUNDS																			
Di-n-butyl phthalate	mg/L	NA	1.48E-01	ND				5.30E-03	J			ND				ND			
Diethyl phthalate	mg/L	NA	1.23E+00	ND				ND				ND				ND			
Phenol	mg/L	NA	9.31E-01	ND				ND				ND				2.00E-03	B		

Table 5-3

Groundwater Analytical Results
DEH Compound, Parcels 64(7) and 1(7)
Fort McClellan, Calhoun County, Alabama

Parcel Sample Location Sample Number Sample Date				FTA-64 FTA-64-MW02 EA3020 13-Nov-98				FTA-64 FTA-64-MW03 EA3021 16-Nov-98				FTA-64 FTA-64-MW04 EA3022 16-Nov-98			
Parameter	**Units**	**BKG[a]**	**SSSL[b]**	**Result**	**Qual**	**>BKG**	**>SSSL**	**Result**	**Qual**	**>BKG**	**>SSSL**	**Result**	**Qual**	**>BKG**	**>SSSL**
METALS															
Aluminum	mg/L	2.34E+00	1.56E+00	ND				ND				ND			
Antimony	mg/L	3.19E-03	6.20E-04	ND				ND				ND			
Arsenic	mg/L	1.78E-02	4.00E-05	ND				ND				ND			
Barium	mg/L	1.27E-01	1.10E-01	ND				ND				ND			
Beryllium	mg/L	1.24E-03	3.12E-03	ND				ND				ND			
Calcium	mg/L	5.65E+01	NA	1.06E+02		YES		2.20E+02		YES		3.02E+02		YES	
Chromium	mg/L	NA	4.69E-03	1.01E-02			YES	ND				ND			
Cobalt	mg/L	2.34E-02	9.39E-02	ND				ND				ND			
Copper	mg/L	2.55E-02	6.26E-02	ND				ND				ND			
Iron	mg/L	7.04E+00	4.69E-01	4.51E-01				7.84E-01			YES	1.01E+00			YES
Lead	mg/L	7.99E-03	1.50E-02	ND				ND				ND			
Magnesium	mg/L	2.13E+01	NA	6.91E+01		YES		1.14E+02		YES		1.59E+02		YES	
Manganese	mg/L	5.81E-01	7.35E-02	1.82E+00		YES	YES	2.72E-01			YES	3.95E-01			YES
Mercury	mg/L	NA	4.60E-04	ND				ND				ND			
Nickel	mg/L	NA	3.13E-02	ND				ND				ND			
Potassium	mg/L	7.20E+00	NA	ND				ND				ND			
Sodium	mg/L	1.48E+01	NA	3.07E+01		YES		6.64E+01		YES		8.29E+01		YES	
Thallium	mg/L	1.45E-03	1.00E-04	ND				ND				ND			
Vanadium	mg/L	1.70E-02	1.10E-02	ND				5.45E-02		YES	YES	6.50E-02		YES	YES
Zinc	mg/L	2.20E-01	4.69E-01	ND				ND				ND			
VOLATILE ORGANIC COMPOUNDS															
1,2,3-Trichlorobenzene	mg/L	NA	1.32E-03	ND				ND				ND			
1,2,4-Trichlorobenzene	mg/L	NA	1.35E-02	ND				ND				ND			
2-Butanone	mg/L	NA	7.14E-01	ND				ND				ND			
2-Hexanone	mg/L	NA	4.93E-03	ND				ND				ND			
Acetone	mg/L	NA	1.56E-01	6.30E-03	B			2.10E-03	B			1.10E-03	B		
Bromomethane	mg/L	NA	2.17E-03	ND				ND				ND			
Carbon disulfide	mg/L	NA	1.51E-01	1.40E-04	J			ND				ND			
Hexachlorobutadiene	mg/L	NA	8.30E-04	ND				ND				ND			
Vinyl chloride	mg/L	NA	3.00E-05	ND				ND				ND			
cis-1,2-Dichloroethene	mg/L	NA	1.55E-02	ND				ND				ND			
p-Cymene	mg/L	NA	2.26E-01	ND				ND				ND			
SEMIVOLATILE ORGANIC COMPOUNDS															
Di-n-butyl phthalate	mg/L	NA	1.48E-01	1.10E-02				5.10E-03	J			3.80E-03	J		
Diethyl phthalate	mg/L	NA	1.23E+00	ND				ND				ND			
Phenol	mg/L	NA	9.31E-01	1.00E-03	B			1.20E-03	B			ND			

Table 5-3

Groundwater Analytical Results
DEH Compound, Parcels 64(7) and 1(7)
Fort McClellan, Calhoun County, Alabama

Analyses performed by Quanterra Environmental Services using U.S. Environmental Protection Agency (EPA) SW-846 analytical methods, including Update III methods where applicable.

[a] Bkg - Background. Concentration listed is two times (2x) the arithmetic mean of background metals concentration given in Science Applications International Corporation (1998), *Final Background Metals Survey Report, Fort McClellan, Alabama*, July.

[b] Residential human health site-specific screening level (SSSL) as given in IT Corporation (2000), *Final Human Health and Ecological Screening Values and PAH Background Summary Report, Fort McClellan, Calhoun County, Alabama*, July.

B - Analyte detected in laboratory or field blank at concentration greater than the reporting limit (and greater than zero).

J - Result is greater than the method detection limit but less than or equal to the reporting limit.

mg/L - Milligrams per liter

NA - Not available

ND - Not detected

Qual - Data validation qualifier

Table 5-4

Surface Water Analytical Results
DEH Compound, Parcels 64(7) and 1(7)
Fort McClellan, Calhoun County, Alabama

(Page 1 of 2)

Parcel / Sample Location / Sample Number / Sample Date					FTA-64 / FTA-64-SW/SD01 / EA2001 / 26-Jan-99					FTA-64 / FTA-64-SW/SD02 / EA2002 / 16-Mar-99					FTA-64 / FTA-64-SW/SD03 / EA2003 / 27-Jan-99				
Parameter	Units	BKG[a]	SSSL[b]	ESV[b]	Result	Qual	>BKG	>SSSL	>ESV	Result	Qual	>BKG	>SSSL	>ESV	Result	Qual	>BKG	>SSSL	>ESV
METALS																			
Aluminum	mg/L	5.26E+00	1.53E+01	8.70E-02	6.05E-01				YES	1.35E+00				YES	1.36E+00				YES
Barium	mg/L	7.53E-02	1.10E+00	3.90E-03	4.16E-02	J			YES	3.64E-02	J			YES	3.85E-02	J			YES
Beryllium	mg/L	3.00E-04	1.75E-02	5.30E-04	1.70E-04	B				ND					ND				
Calcium	mg/L	2.52E+01	NA	1.16E+02	4.23E+01		YES			3.47E+01		YES			1.77E+01				
Chromium	mg/L	1.11E-02	4.08E-02	1.10E-02	3.20E-03	J				4.20E-03	B				1.92E-02		YES		YES
Copper	mg/L	1.27E-02	6.23E-01	6.54E-03	ND					5.80E-03	B				ND				
Iron	mg/L	1.96E+01	4.70E+00	1.00E+00	8.86E-01					2.42E+00				YES	2.37E+00				YES
Lead	mg/L	8.60E-03	1.50E-02	1.32E-03	3.50E-03				YES	4.20E-03				YES	1.70E-03	J			YES
Magnesium	mg/L	1.10E+01	NA	8.20E+01	2.40E+01		YES			1.40E+01		YES			1.06E+01				
Manganese	mg/L	5.65E-01	6.40E-01	8.00E-02	3.83E-02					2.80E-02					4.31E-02				
Mercury	mg/L	NA	4.25E-03	1.00E-05	ND					ND					5.40E-05	J			YES
Potassium	mg/L	2.56E+00	NA	5.30E+01	1.30E+00	B				1.57E+00	J				1.31E+00	J			
Sodium	mg/L	3.44E+00	NA	6.80E+02	1.21E+01		YES			2.41E+00	B				4.05E+00	J	YES		
Vanadium	mg/L	1.52E-02	7.90E-02	1.90E-02	2.50E-03	B				ND					ND				
Zinc	mg/L	4.03E-02	4.65E+00	5.89E-02	2.54E-02					3.64E-02					1.85E-02	J			
VOLATILE ORGANIC COMPOUNDS																			
Acetone	mg/L	NA	1.57E+00	7.80E+01	ND					3.30E-03	B				5.20E-03	J			
Methylene chloride	mg/L	NA	1.42E-01	1.93E+00	ND					ND					1.10E-03	B			
cis-1,2-Dichloroethene	mg/L	NA	1.49E-01	1.16E+01	1.50E-04	J				ND					ND				
SEMIVOLATILE ORGANIC COMPOUNDS																			
Phenol	mg/L	NA	9.06E+00	2.56E-01	ND					ND					6.70E-03	J			
bis(2-Ethylhexyl)phthalate	mg/L	NA	5.17E-02	3.00E-04	3.90E-03	B			YES	1.80E-03	J			YES	1.30E-03	J			YES
PESTICIDES																			
4,4'-DDD	mg/L	NA	1.32E-03	6.40E-06	ND					ND					7.30E-05				YES
4,4'-DDT	mg/L	NA	6.70E-04	1.00E-06	ND					ND					9.60E-04			YES	YES
HERBICIDES																			
2,2-Dichloropropanoic Acid	mg/L	NA	4.69E-01	NA	ND					ND					ND				

Table 5-4

Surface Water Analytical Results
DEH Compound, Parcels 64(7) and 1(7)
Fort McClellan, Calhoun County, Alabama

Parcel Sample Location Sample Number Sample Date					FTA-151 FTA-151-SW/SD01 BJ2001 23-Oct-98					FTA-151 FTA-151-SW/SD02 BJ2002 23-Oct-98					FTA-151 FTA-151-SW/SD03 BJ2003 23-Oct-98				
Parameter	**Units**	**BKG[a]**	**SSSL[b]**	**ESV[b]**	**Result**	**Qual**	**>BKG**	**>SSSL**	**>ESV**	**Result**	**Qual**	**>BKG**	**>SSSL**	**>ESV**	**Result**	**Qual**	**>BKG**	**>SSSL**	**>ESV**
METALS																			
Aluminum	mg/L	5.26E+00	1.53E+01	8.70E-02	ND					ND					ND				
Barium	mg/L	7.53E-02	1.10E+00	3.90E-03	ND					ND					ND				
Beryllium	mg/L	3.00E-04	1.75E-02	5.30E-04	ND					ND					ND				
Calcium	mg/L	2.52E+01	NA	1.16E+02	2.01E+01					1.99E+01					1.96E+01				
Chromium	mg/L	1.11E-02	4.08E-02	1.10E-02	ND					ND					ND				
Copper	mg/L	1.27E-02	6.23E-01	6.54E-03	ND					ND					ND				
Iron	mg/L	1.96E+01	4.70E+00	1.00E+00	ND					ND					ND				
Lead	mg/L	8.60E-03	1.50E-02	1.32E-03	3.70E-03	B			YES	3.20E-03	B			YES	3.90E-03	B			YES
Magnesium	mg/L	1.10E+01	NA	8.20E+01	ND					ND					ND				
Manganese	mg/L	5.65E-01	6.40E-01	8.00E-02	ND					ND					ND				
Mercury	mg/L	NA	4.25E-03	1.00E-05	ND					ND					ND				
Potassium	mg/L	2.56E+00	NA	5.30E+01	ND					ND					ND				
Sodium	mg/L	3.44E+00	NA	6.80E+02	ND					ND					ND				
Vanadium	mg/L	1.52E-02	7.90E-02	1.90E-02	ND					ND					ND				
Zinc	mg/L	4.03E-02	4.65E+00	5.89E-02	ND					ND					ND				
VOLATILE ORGANIC COMPOUNDS																			
Acetone	mg/L	NA	1.57E+00	7.80E+01	1.70E-03	J				1.70E-03	J				1.70E-03	J			
Methylene chloride	mg/L	NA	1.42E-01	1.93E+00	ND					ND					ND				
cis-1,2-Dichloroethene	mg/L	NA	1.49E-01	1.16E+01	ND					ND					ND				
SEMIVOLATILE ORGANIC COMPOUNDS																			
Phenol	mg/L	NA	9.06E+00	2.56E-01	7.40E-03	B				4.10E-03	B				8.10E-03	B			
bis(2-Ethylhexyl)phthalate	mg/L	NA	5.17E-02	3.00E-04	ND					ND					3.50E-03	J			YES
PESTICIDES																			
4,4'-DDD	mg/L	NA	1.32E-03	6.40E-06	ND					ND					ND				
4,4'-DDT	mg/L	NA	6.70E-04	1.00E-06	ND					ND					ND				
HERBICIDES																			
2,2-Dichloropropanoic Acid	mg/L	NA	4.69E-01	NA	ND					ND					2.70E-03	J			

Analyses performed by Quanterra Environmental Services using U.S. Environmental Protection Agency (EPA) SW-846 analytical methods, including Update III methods where applicable.

[a] Bkg - Background. Concentration listed is two times (2x) the arithmetic mean of background metals concentration given in Science Applications International Corporation (1998), *Final Background Metals Survey Report, Fort McClellan, Alabama,* July.

[b] Recreational site user site-specific screening level (SSSL) and ecological screening value (ESV) as given in IT Corporation (2000), *Final Human Health and Ecological Screening Values and PAH Background Summary Report, Fort McClellan, Calhoun County*, *Alabama,* July.

B - Analyte detected in laboratory or field blank at concentration greater than the reporting limit (and greater than zero).

J - Result is greater than the method detection limit but less than or equal to the reporting limit.

mg/L - Milligrams per liter.

NA - Not available.

ND - Not detected.

Qual - Data validation qualifier.

Table 5-5

Sediment Analytical Results
DEH Compound, Parcels 64(7) and 1(7)
Fort McClellan, Calhoun County, Alabama

Parcel Sample Location Sample Number Sample Date Sample Depth (Feet)					FTA-64 FTA-64-SW/SD01 EA1001 26-Jan-99 0- .5					FTA-64 FTA-64-SW/SD02 EA1004 16-Mar-99 0- 1					FTA-64 FTA-64-SW/SD03 EA1005 27-Jan-99 0- .5				
Parameter	**Units**	**BKG[a]**	**SSSL[b]**	**ESV[b]**	**Result**	**Qual**	**>BKG**	**>SSSL**	**>ESV**	**Result**	**Qual**	**>BKG**	**>SSSL**	**>ESV**	**Result**	**Qual**	**>BKG**	**>SSSL**	**>ESV**
METALS																			
Aluminum	mg/kg	8.59E+03	1.15E+06	NA	5.50E+03					7.93E+03					8.44E+03				
Antimony	mg/kg	7.30E-01	4.22E+02	1.20E+01	9.10E-01	J	YES			ND					ND				
Arsenic	mg/kg	1.13E+01	5.58E+01	7.24E+00	1.11E+01				YES	6.50E+00					5.20E+00				
Barium	mg/kg	9.89E+01	8.36E+04	NA	5.66E+01					4.17E+01					5.19E+01				
Beryllium	mg/kg	9.70E-01	1.50E+02	NA	6.20E-01	J				8.40E-01					8.20E-01				
Cadmium	mg/kg	4.30E-01	1.71E+02	1.00E+00	2.10E+00		YES		YES	ND					ND				
Calcium	mg/kg	1.11E+03	NA	NA	1.61E+04		YES			1.20E+03		YES			1.57E+03		YES		
Chromium	mg/kg	3.12E+01	2.79E+03	5.23E+01	6.59E+01		YES		YES	1.71E+01					1.12E+02		YES		YES
Cobalt	mg/kg	1.10E+01	6.72E+04	5.00E+01	9.20E+00	J				4.70E+00	J				1.13E+01		YES		
Copper	mg/kg	1.71E+01	4.74E+04	1.87E+01	3.43E+01	J	YES		YES	3.08E+01		YES		YES	2.27E+01		YES		YES
Iron	mg/kg	3.53E+04	3.59E+05	NA	2.05E+04					4.03E+04		YES			2.69E+04				
Lead	mg/kg	3.78E+01	4.00E+02	3.02E+01	6.62E+01		YES		YES	1.40E+01					1.75E+01				
Magnesium	mg/kg	9.06E+02	NA	NA	8.99E+03		YES			1.37E+03		YES			2.72E+03		YES		
Manganese	mg/kg	7.12E+02	4.38E+04	NA	2.10E+02					8.73E+01	J				2.67E+02				
Mercury	mg/kg	1.10E-01	2.99E+02	1.30E-01	2.00E-01		YES		YES	5.10E-02					4.50E-02				
Nickel	mg/kg	1.30E+01	1.76E+04	1.59E+01	1.29E+01					9.20E+00					1.87E+01		YES		YES
Potassium	mg/kg	1.01E+03	NA	NA	4.81E+02	J				3.09E+02	J				3.83E+02	J			
Selenium	mg/kg	7.20E-01	5.96E+03	NA	5.30E-01	J				5.70E+00		YES			1.80E+00	B	YES		
Silver	mg/kg	3.20E-01	6.07E+03	2.00E+00	2.10E-01	J				ND					ND				
Sodium	mg/kg	6.92E+02	NA	NA	8.79E+01	B				8.36E+01	B				6.86E+01	B			
Thallium	mg/kg	1.30E-01	7.78E+01	NA	ND					5.10E-01	B	YES			ND				
Vanadium	mg/kg	4.09E+01	4.83E+03	NA	2.26E+01					2.97E+01					2.28E+01				
Zinc	mg/kg	5.27E+01	3.44E+05	1.24E+02	2.61E+02		YES		YES	4.13E+01	J				1.17E+02		YES		
VOLATILE ORGANIC COMPOUNDS																			
2-Butanone	mg/kg	NA	6.23E+05	1.37E-01	ND					ND					ND				
Acetone	mg/kg	NA	1.03E+05	4.53E-01	ND					9.70E-03	J				ND				
Bromomethane	mg/kg	NA	1.43E+03	NA	ND					ND					1.60E-03	J			
Carbon disulfide	mg/kg	NA	1.04E+05	1.34E-01	ND					ND					ND				
Methylene chloride	mg/kg	NA	9.84E+03	1.26E+00	6.00E-03	B				3.90E-03	B				3.80E-03	B			
Toluene	mg/kg	NA	2.11E+05	6.70E-01	ND					ND					ND				

Table 5-5

Sediment Analytical Results
DEH Compound, Parcels 64(7) and 1(7)
Fort McClellan, Calhoun County, Alabama

Parcel Sample Location Sample Number Sample Date Sample Depth (Feet)					FTA-64 FTA-64-SW/SD01 EA1001 26-Jan-99 0- .5					FTA-64 FTA-64-SW/SD02 EA1004 16-Mar-99 0- 1					FTA-64 FTA-64-SW/SD03 EA1005 27-Jan-99 0- .5				
Parameter	**Units**	**BKG[a]**	**SSSL[b]**	**ESV[b]**	**Result**	**Qual**	**>BKG**	**>SSSL**	**>ESV**	**Result**	**Qual**	**>BKG**	**>SSSL**	**>ESV**	**Result**	**Qual**	**>BKG**	**>SSSL**	**>ESV**
SEMIVOLATILE ORGANIC COMPOUNDS																			
Acenaphthene	mg/kg	NA	5.59E+04	3.30E-01	ND					1.30E-01	J				ND				
Anthracene	mg/kg	NA	2.99E+05	3.30E-01	ND					3.90E-01	J			YES	ND				
Benzo(a)anthracene	mg/kg	NA	8.93E+01	3.30E-01	7.80E-02	J				8.80E-01	J			YES	ND				
Benzo(a)pyrene	mg/kg	NA	8.93E+00	3.30E-01	ND					8.10E-01	J			YES	ND				
Benzo(b)fluoranthene	mg/kg	NA	8.93E+01	6.55E-01	1.20E-01	J				1.10E+00	J			YES	ND				
Benzo(ghi)perylene	mg/kg	NA	2.79E+04	6.55E-01	ND					3.70E-01	J				ND				
Benzo(k)fluoranthene	mg/kg	NA	8.93E+02	6.55E-01	ND					4.30E-01	J				ND				
Carbazole	mg/kg	NA	3.26E+03	NA	ND					3.80E-01	J				ND				
Chrysene	mg/kg	NA	9.79E+03	3.30E-01	8.70E-02	J				8.70E-01	J			YES	ND				
Di-n-butyl phthalate	mg/kg	NA	1.14E+05	1.11E-01	ND					ND					5.90E-02	J			
Dibenzofuran	mg/kg	NA	3.73E+03	1.52E+00	ND					7.70E-02	J				ND				
Fluoranthene	mg/kg	NA	3.73E+04	3.30E-01	1.90E-01	J				2.00E+00	J			YES	ND				
Fluorene	mg/kg	NA	3.73E+04	3.30E-01	ND					1.90E-01	J				ND				
Indeno(1,2,3-cd)pyrene	mg/kg	NA	8.93E+01	6.55E-01	ND					4.40E-01	J				ND				
Naphthalene	mg/kg	NA	2.11E+04	3.46E-02	ND					7.50E-02	J			YES	ND				
Phenanthrene	mg/kg	NA	2.79E+05	3.30E-01	1.10E-01	J				1.50E+00	J			YES	ND				
Pyrene	mg/kg	NA	3.06E+04	3.30E-01	1.50E-01	J				1.40E+00				YES	ND				
bis(2-Ethylhexyl)phthalate	mg/kg	NA	5.41E+03	1.82E-01	1.00E-01	B				ND					1.40E-01	J			
PESTICIDES																			
4,4'-DDD	mg/kg	NA	2.35E+02	3.30E-03	1.80E-02				YES	ND					3.00E-01				YES
4,4'-DDE	mg/kg	NA	1.66E+02	3.30E-03	ND					ND					1.60E-01				YES
4,4'-DDT	mg/kg	NA	1.66E+02	3.30E-03	2.10E-02				YES	ND					2.00E+00				YES

Table 5-5

Sediment Analytical Results
DEH Compound, Parcels 64(7) and 1(7)
Fort McClellan, Calhoun County, Alabama

Parcel Sample Location Sample Number Sample Date Sample Depth (Feet)					FTA-151 FTA-151-SW/SD01 BJ1001 23-Oct-98 0- .5					FTA-151 FTA-151-SW/SD02 BJ1002 23-Oct-98 0- .5					FTA-151 FTA-151-SW/SD03 BJ1003 23-Oct-98 0- .5				
Parameter	Units	BKG[a]	SSSL[b]	ESV[b]	Result	Qual	>BKG	>SSSL	>ESV	Result	Qual	>BKG	>SSSL	>ESV	Result	Qual	>BKG	>SSSL	>ESV
METALS																			
Aluminum	mg/kg	8.59E+03	1.15E+06	NA	3.05E+03					8.70E+03		YES			3.49E+03				
Antimony	mg/kg	7.30E-01	4.22E+02	1.20E+01	ND					ND					ND				
Arsenic	mg/kg	1.13E+01	5.58E+01	7.24E+00	4.50E+00					3.60E+00					3.30E+00				
Barium	mg/kg	9.89E+01	8.36E+04	NA	7.33E+01					9.60E+01					2.86E+01				
Beryllium	mg/kg	9.70E-01	1.50E+02	NA	7.10E-01					1.80E+00		YES			ND				
Cadmium	mg/kg	4.30E-01	1.71E+02	1.00E+00	ND					ND					ND				
Calcium	mg/kg	1.11E+03	NA	NA	8.00E+02	J				3.57E+04	J	YES			1.83E+03	J	YES		
Chromium	mg/kg	3.12E+01	2.79E+03	5.23E+01	2.16E+01					1.46E+01					9.60E+00				
Cobalt	mg/kg	1.10E+01	6.72E+04	5.00E+01	1.29E+01		YES			ND					ND				
Copper	mg/kg	1.71E+01	4.74E+04	1.87E+01	2.54E+01		YES		YES	2.28E+01		YES		YES	2.33E+01		YES		YES
Iron	mg/kg	3.53E+04	3.59E+05	NA	2.42E+04					2.17E+04					1.50E+04				
Lead	mg/kg	3.78E+01	4.00E+02	3.02E+01	8.58E+01		YES		YES	6.20E+01		YES		YES	7.85E+01		YES		YES
Magnesium	mg/kg	9.06E+02	NA	NA	9.89E+02	J	YES			7.49E+03	J	YES			1.90E+03	J	YES		
Manganese	mg/kg	7.12E+02	4.38E+04	NA	6.49E+02					5.22E+02					3.42E+02				
Mercury	mg/kg	1.10E-01	2.99E+02	1.30E-01	ND					ND					ND				
Nickel	mg/kg	1.30E+01	1.76E+04	1.59E+01	1.08E+01					ND					9.80E+00				
Potassium	mg/kg	1.01E+03	NA	NA	ND					1.03E+03		YES			ND				
Selenium	mg/kg	7.20E-01	5.96E+03	NA	ND					ND					ND				
Silver	mg/kg	3.20E-01	6.07E+03	2.00E+00	ND					ND					ND				
Sodium	mg/kg	6.92E+02	NA	NA	ND					ND					ND				
Thallium	mg/kg	1.30E-01	7.78E+01	NA	ND					ND					ND				
Vanadium	mg/kg	4.09E+01	4.83E+03	NA	ND					7.40E+00					ND				
Zinc	mg/kg	5.27E+01	3.44E+05	1.24E+02	4.56E+01					3.85E+01					4.84E+01				
VOLATILE ORGANIC COMPOUNDS																			
2-Butanone	mg/kg	NA	6.23E+05	1.37E-01	7.70E-03	J				ND					ND				
Acetone	mg/kg	NA	1.03E+05	4.53E-01	8.30E-02	J				3.10E-02	B				4.70E-02	B			
Bromomethane	mg/kg	NA	1.43E+03	NA	ND					3.00E-03	B				3.40E-03	B			
Carbon disulfide	mg/kg	NA	1.04E+05	1.34E-01	2.60E-03	J				4.50E-03	J				6.30E-03	J			
Methylene chloride	mg/kg	NA	9.84E+03	1.26E+00	1.20E-02	B				9.80E-03	B				9.20E-03	B			
Toluene	mg/kg	NA	2.11E+05	6.70E-01	2.50E-03	J				ND					ND				

Table 5-5

Sediment Analytical Results
DEH Compound, Parcels 64(7) and 1(7)
Fort McClellan, Calhoun County, Alabama

Parcel					FTA-151					FTA-151					FTA-151				
Sample Location					FTA-151-SW/SD01					FTA-151-SW/SD02					FTA-151-SW/SD03				
Sample Number					BJ1001					BJ1002					BJ1003				
Sample Date					23-Oct-98					23-Oct-98					23-Oct-98				
Sample Depth (Feet)					0- .5					0- .5					0- .5				
Parameter	**Units**	**BKG[a]**	**SSSL[b]**	**ESV[b]**	**Result**	**Qual**	**>BKG**	**>SSSL**	**>ESV**	**Result**	**Qual**	**>BKG**	**>SSSL**	**>ESV**	**Result**	**Qual**	**>BKG**	**>SSSL**	**>ESV**
SEMIVOLATILE ORGANIC COMPOUNDS																			
Acenaphthene	mg/kg	NA	5.59E+04	3.30E-01	ND					ND					ND				
Anthracene	mg/kg	NA	2.99E+05	3.30E-01	ND					ND					ND				
Benzo(a)anthracene	mg/kg	NA	8.93E+01	3.30E-01	ND					ND					ND				
Benzo(a)pyrene	mg/kg	NA	8.93E+00	3.30E-01	ND					ND					ND				
Benzo(b)fluoranthene	mg/kg	NA	8.93E+01	6.55E-01	ND					ND					ND				
Benzo(ghi)perylene	mg/kg	NA	2.79E+04	6.55E-01	ND					ND					ND				
Benzo(k)fluoranthene	mg/kg	NA	8.93E+02	6.55E-01	ND					ND					ND				
Carbazole	mg/kg	NA	3.26E+03	NA	ND					ND					ND				
Chrysene	mg/kg	NA	9.79E+03	3.30E-01	ND					ND					ND				
Di-n-butyl phthalate	mg/kg	NA	1.14E+05	1.11E-01	1.20E-01	B			YES	2.60E-01	B			YES	3.10E-01	B			YES
Dibenzofuran	mg/kg	NA	3.73E+03	1.52E+00	ND					ND					ND				
Fluoranthene	mg/kg	NA	3.73E+04	3.30E-01	ND					ND					ND				
Fluorene	mg/kg	NA	3.73E+04	3.30E-01	ND					ND					ND				
Indeno(1,2,3-cd)pyrene	mg/kg	NA	8.93E+01	6.55E-01	ND					ND					ND				
Naphthalene	mg/kg	NA	2.11E+04	3.46E-02	ND					ND					ND				
Phenanthrene	mg/kg	NA	2.79E+05	3.30E-01	ND					ND					ND				
Pyrene	mg/kg	NA	3.06E+04	3.30E-01	ND					ND					ND				
bis(2-Ethylhexyl)phthalate	mg/kg	NA	5.41E+03	1.82E-01	9.80E-02	B				8.70E-02	B				1.00E-01	B			
PESTICIDES																			
4,4'-DDD	mg/kg	NA	2.35E+02	3.30E-03	ND					ND					ND				
4,4'-DDE	mg/kg	NA	1.66E+02	3.30E-03	ND					ND					ND				
4,4'-DDT	mg/kg	NA	1.66E+02	3.30E-03	ND					ND					ND				

Analyses performed by Quanterra Environmental Services using U.S. Environmental Protection Agency (EPA) SW-846 analytical methods, including Update III methods where applicable.

[a] Bkg - Background. Concentration listed is two times (2x) the arithmetic mean of background metals concentration given in Science Applications International Corporation (1998), *Final Background Metals Survey Report, Fort McClellan, Alabama,* July.

[b] Recreational site user site-specific screening level (SSSL) and ecological screening value (ESV) as given in IT Corporation (2000), *Final Human Health and Ecological Screening Values and PAH Background Summary Report, Fort McClellan, Calhoun County*, *Alabama,* July.

B - Analyte detected in laboratory or field blank at concentration greater than the reporting limit (and greater than zero).

J - Result is greater than the method detection limit but less than or equal to the reporting limit.

mg/kg - Milligrams per kilogram.

NA - Not available.

ND - Not detected.

Qual - Data validation qualifier.

Table 5-5

Sediment Analytical Results
DEH Compound, Parcels 64(7) and 1(7)
Fort McClellan, Calhoun County, Alabama

Parcel Sample Location Sample Number Sample Date Sample Depth (Feet)				
Parameter	**Units**	**BKG[a]**	**SSSL[b]**	**ESV[b]**
METALS				
Aluminum	mg/kg	8.59E+03	1.15E+06	NA
Antimony	mg/kg	7.30E-01	4.22E+02	1.20E+01
Arsenic	mg/kg	1.13E+01	5.58E+01	7.24E+00
Barium	mg/kg	9.89E+01	8.36E+04	NA
Beryllium	mg/kg	9.70E-01	1.50E+02	NA
Cadmium	mg/kg	4.30E-01	1.71E+02	1.00E+00
Calcium	mg/kg	1.11E+03	NA	NA
Chromium	mg/kg	3.12E+01	2.79E+03	5.23E+01
Cobalt	mg/kg	1.10E+01	6.72E+04	5.00E+01
Copper	mg/kg	1.71E+01	4.74E+04	1.87E+01
Iron	mg/kg	3.53E+04	3.59E+05	NA
Lead	mg/kg	3.78E+01	4.00E+02	3.02E+01
Magnesium	mg/kg	9.06E+02	NA	NA
Manganese	mg/kg	7.12E+02	4.38E+04	NA
Mercury	mg/kg	1.10E-01	2.99E+02	1.30E-01
Nickel	mg/kg	1.30E+01	1.76E+04	1.59E+01
Potassium	mg/kg	1.01E+03	NA	NA
Selenium	mg/kg	7.20E-01	5.96E+03	NA
Silver	mg/kg	3.20E-01	6.07E+03	2.00E+00
Sodium	mg/kg	6.92E+02	NA	NA
Thallium	mg/kg	1.30E-01	7.78E+01	NA
Vanadium	mg/kg	4.09E+01	4.83E+03	NA
Zinc	mg/kg	5.27E+01	3.44E+05	1.24E+02
VOLATILE ORGANIC COMPOUNDS				
2-Butanone	mg/kg	NA	6.23E+05	1.37E-01
Acetone	mg/kg	NA	1.03E+05	4.53E-01
Bromomethane	mg/kg	NA	1.43E+03	NA
Carbon disulfide	mg/kg	NA	1.04E+05	1.34E-01
Methylene chloride	mg/kg	NA	9.84E+03	1.26E+00
Toluene	mg/kg	NA	2.11E+05	6.70E-01

Table 5-5

Sediment Analytical Results
DEH Compound, Parcels 64(7) and 1(7)
Fort McClellan, Calhoun County, Alabama

Parcel Sample Location Sample Number Sample Date Sample Depth (Feet)				
Parameter	**Units**	**BKG[a]**	**SSSL[b]**	**ESV[b]**
SEMIVOLATILE ORGANIC COMPOUNDS				
Acenaphthene	mg/kg	NA	5.59E+04	3.30E-01
Anthracene	mg/kg	NA	2.99E+05	3.30E-01
Benzo(a)anthracene	mg/kg	NA	8.93E+01	3.30E-01
Benzo(a)pyrene	mg/kg	NA	8.93E+00	3.30E-01
Benzo(b)fluoranthene	mg/kg	NA	8.93E+01	6.55E-01
Benzo(ghi)perylene	mg/kg	NA	2.79E+04	6.55E-01
Benzo(k)fluoranthene	mg/kg	NA	8.93E+02	6.55E-01
Carbazole	mg/kg	NA	3.26E+03	NA
Chrysene	mg/kg	NA	9.79E+03	3.30E-01
Di-n-butyl phthalate	mg/kg	NA	1.14E+05	1.11E-01
Dibenzofuran	mg/kg	NA	3.73E+03	1.52E+00
Fluoranthene	mg/kg	NA	3.73E+04	3.30E-01
Fluorene	mg/kg	NA	3.73E+04	3.30E-01
Indeno(1,2,3-cd)pyrene	mg/kg	NA	8.93E+01	6.55E-01
Naphthalene	mg/kg	NA	2.11E+04	3.46E-02
Phenanthrene	mg/kg	NA	2.79E+05	3.30E-01
Pyrene	mg/kg	NA	3.06E+04	3.30E-01
bis(2-Ethylhexyl)phthalate	mg/kg	NA	5.41E+03	1.82E-01
PESTICIDES				
4,4'-DDD	mg/kg	NA	2.35E+02	3.30E-03
4,4'-DDE	mg/kg	NA	1.66E+02	3.30E-03
4,4'-DDT	mg/kg	NA	1.66E+02	3.30E-03

Volatile Organic Compounds. Seventeen VOCs were detected in surface and depositional soil samples collected at the DEH Compound, Parcels 64(7) and 1(7). The 2-butanone, methylene chloride, and trichlorofluoromethane results were flagged with a "B" data qualifier, signifying that these compounds were also detected in an associated laboratory or field blank sample. Sample location FTA-64-GP15 contained fifteen of the seventeen detected VOCs. VOC concentrations in the surface and depositional soil samples ranged from 0.0018 mg/kg to 0.28 mg/kg, and the cumulative concentration was 0.639 mg/kg.

The VOC concentrations in surface and depositional soils were below SSSLs. The concentration of trichloroethene (TCE) (0.0034 mg/kg) exceeded the ESV (0.001 mg/kg) in one surface soil sample (FTA-64-GP15).

Semivolatile Organic Compounds. Twenty-one SVOCs, including fifteen PAH compounds and six non-PAH compounds, were detected in surface and depositional soil samples collected at the DEH Compound, Parcels 64(7) and 1(7). The bis(2-ethylhexyl)phthalate results were flagged with a "B" data qualifier, signifying that the compound was also detected in an associated laboratory or field blank sample. Benzo(g,h,i)perylene (FTA-64-DEP02), 2,4,5-trichlorophenol (FTA-64-GP15), dibenzo(a,h)anthracene (FTA-64-GP01), dibenzofuran (FTA-64-GP06), and fluorene (FTA-64-GP06) were each detected in only one of the samples. SVOCs were not detected at sample locations FTA-64-GP02 and FTA-64-GP14. Sample location FTA-64-GP06 contained eighteen of the twenty-one detected SVOCs. SVOC concentrations in the surface and depositional soil samples ranged from 0.037 mg/kg to 3.8 mg/kg and the cumulative concentration was 27.4 mg/kg.

The concentrations of three SVOCs (PAH compounds), including benzo(a)pyrene, benzo(a)anthracene, and benzo(b)fluoranthene, exceeded SSSLs and PAH background values at one sample location (FTA-64-GP06).

The concentrations of four PAH compounds exceeded ESVs and PAH background values at one sample location (FTA-64-GP06). In addition, the concentrations of one non-PAH compound (pentachlorophenol) exceeded the ESV at two sample locations (FTA-64-GP01 and FTA-64-GP15).

Pesticides. Six pesticides, including 4,4'-dichlorodiphenyldichloroethane (DDD), 4,4'-DDT, endosulfan sulfate, endrin ketone, methoxychlor, and chlordane, were detected in surface and depositional soil samples collected at the DEH Compound, Parcels 64(7) and 1(7). One or more of these pesticides were detected at three sample locations (FTA-64-GP06, FTA-64-GP15, and FTA-64-DEP02). Sample location FTA-64-DEP02 contained four of the six detected pesticides. Pesticide concentrations in the surface and depositional soil samples ranged from 0.0032 mg/kg to 8.7 mg/kg, and the cumulative concentration was 16.7 mg/kg.

The concentrations of 4,4'-DDD (8.7 mg/kg) and 4,4'-DDT (7.7 mkg/kg) exceeded SSSLs (2.54 mg/kg and 1.79 mg/kg) at one surface soil sample location (FTA-64-GP15). The concentrations of 4,4'-DDD (FTA-64-DEP02 and FTA-64-GP15), chlordane (FTA-64-GP06), and 4,4'-DDT (FTA-64-GP15) exceeded ESVs.

Herbicides. The herbicides 2,4,5-trichlorophenoxyacetic acid (2,4,5-T) and silvex (2,4,5-TP) were detected at one surface soil sample location (FTA-64-GP15). Herbicides were not detected at any of the other sample locations. The herbicide concentrations were below SSSLs and ESVs.

Dioxins. Two of the nine surface and depositional soil samples were analyzed for dioxins. Twenty-three dioxin compounds were detected at sample locations FTA-64-GP01 and FTA-64-GP02. Sample location FTA-64-GP02 contained each of the detected dioxins. Dioxin concentrations in the surface and depositional soil samples ranged from 0.0000003 mg/kg to 0.013 mg/kg and the cumulative concentration was 0.0231 mg/kg.

The concentrations of 1,2,3,4,6,7,8-heptachlorodibenzo-p-dioxin (FTA-64-GP02) and octachlorodibenzo-p-dioxin (both locations) exceeded SSSLs. Dioxin concentrations were below ESVs.

5.2 Subsurface Soil Analytical Results

Fifteen subsurface soil samples were collected for chemical analyses at the DEH Compound, Parcels 64(7) and 1(7). Subsurface soil samples were collected at depths greater than 1 foot bgs at the locations shown on Figure 3-1. Analytical results were compared to residential human health SSSLs and metals background concentrations, as presented in Table 5-2.

Metals. Nineteen metals were detected in subsurface soil samples collected at the DEH Compound, Parcels 64(7) and 1(7). Cadmium and mercury were detected only at sample location FTA-64-GP15. In addition, FTA-64-GP15 contained each of the detected metals except vanadium.

The concentrations of five metals (aluminum, arsenic, chromium, iron, and manganese) exceeded SSSLs. With the exception of aluminum (five locations) and iron (one location), these metals concentrations were below their respective background concentration. The aluminum and iron results were within the range of background values determined by SAIC (1998) (Appendix H).

Volatile Organic Compounds. Six VOCs, including 2-butanone, acetone, carbon disulfide, cis-1,2-dichloroethene (DCE), methylene chloride, and TCE, were detected in subsurface soil samples collected at the DEH Compound, Parcels 64(7) and 1(7). Acetone, 2-butanone, and/or methylene chloride were the only detected VOCs at each sample location except FTA-64-GP05 and FTA-64-GP15. The acetone, 2-butanone, and methylene chloride results were flagged with a "B" data qualifier, signifying that these compounds were also detected in an associated laboratory or field blank sample. Sample location FTA-64-GP15 contained five of the six detected VOCs. VOC concentrations in the subsurface soil samples ranged from 0.0017 mg/kg to 0.06 mg/kg, and the cumulative concentration was 0.433 mg/kg.

The VOC concentrations in subsurface soils were below SSSLs.

Semivolatile Organic Compounds. Sixteen SVOCs, including thirteen PAH compounds and three non-PAH compounds, were detected in subsurface soil samples collected at the DEH Compound, Parcels 64(7) and 1(7). The bis(2-ethylhexyl)phthalate results and two of the di-n-butyl phthalate results were flagged with a "B" data qualifier, signifying that these compounds was also detected in an associated laboratory or field blank sample. SVOCs were not detected at six locations and bis(2-ethylhexyl)phthalate and/or di-n-butyl phthalate were the only detected SVOCs at eight additional sample locations. Fourteen of the sixteen detected SVOCs, all of which were PAH compounds, were present in the sample collected at FTA-64-GP08. SVOC concentrations in the subsurface soil samples ranged from 0.044 mg/kg to 0.44 mg/kg, and the cumulative concentration was 3.47 mg/kg.

The concentration of benzo(a)pyrene exceeded the SSSL at one sample location (FTA-64-GP08).

Dioxins. Four dioxin compounds were detected at sample locations FTA-64-GP01 and FTA-64-GP02 at concentrations below SSSLs.

5.3 Groundwater Analytical Results

Fourteen temporary monitoring wells and four existing wells were sampled at the DEH Compound, Parcels 64(7) and 1(7), at the locations shown on Figure 3-1. Analytical results were compared to residential human health SSSLs and metals background concentrations, as presented in Table 5-3.

Metals. Twenty metals were detected in groundwater samples collected at the DEH Compound, Parcels 64(7) and 1(7). The beryllium results were flagged with a "B" data qualifier, signifying that beryllium was also detected in an associated laboratory or field blank sample. Mercury was detected at only one sample location (FTA-64-GP15). Samples collected from the existing monitoring wells (FTA-64-MW01, FTA-64-MW02, FTA-64-MW03, and FTA-64-MW04) each contained fewer than half of the twenty detected metals.

Several metals were detected at concentrations exceeding SSSLs and background concentrations. However, the majority of these metals were present in seven groundwater samples that had high turbidity (greater than 100 NTUs) at the time of sample collection. To evaluate the effects of turbidity on metals concentrations in groundwater at FTMC, IT resampled five wells that previously had high turbidity using a "low-flow" groundwater purging and sampling technique to reduce turbidity to below 10 NTUs. The resampling effort demonstrated that the concentrations of most metals in the lower turbidity samples were significantly lower (1 to 2 orders of magnitude) than in the higher turbidity samples (IT, 2000c) (Appendix I). Consequently, the elevated metals results in the groundwater samples collected at the DEH Compound, Parcels 64(7) and 1(7), are likely the result of high turbidity.

Evaluation of six wells at Parcel 64(7) that had low turbidity (less than 10 NTUs) at the time of sample collection indicates that the following metals concentrations exceeded SSSLs and their respective background concentration: aluminum (one location), iron (one location), manganese (four locations), thallium (one location), and vanadium (four locations). The concentrations of mercury and chromium also exceeded SSSLs at one location each; however, background concentrations for these metals were not available. With the exception of the thallium and vanadium results, the metals concentrations in the samples from the low turbidity wells were within the range of background values determined by SAIC (1998) (Appendix I). The thallium and vanadium results were within the same order of magnitude as the background concentrations.

Volatile Organic Compounds. Eleven VOCs, including 1,2,3-trichlorobenzene, 1,2,4-trichlorobenzene, 2-butanone, 2-hexanone, acetone, bromomethane, carbon disulfide, cis-1,2-

DCE, hexachlorobutadiene, p-cymene, and vinyl chloride, were detected in groundwater samples collected at the DEH Compound, Parcels 64(7) and 1(7). The bromomethane results, hexachlorobutadiene results, and all but one of the acetone results were flagged with a "B" data qualifier, signifying that these compounds were also detected in an associated laboratory or field blank sample. Vinyl chloride and cis-1,2-DCE were detected in two of the samples and the results were flagged with a "J" data qualifier, signifying that the results were greater than the method detection limit but less than the RL. VOCs were not detected at seven sample locations. Acetone, a common laboratory contaminant, was the only detected VOC at four sample locations (FTA-64-GP06, FTA-64-GP15, FTA-64-MW03, and FTA-64-MW04). VOC concentrations in the groundwater samples ranged from 0.00013 milligrams per liter (mg/L) to 0.031 mg/L and the cumulative concentration was 0.117 mg/L.

The concentrations of vinyl chloride (0.00043 mg/L and 0.00016 mg/L) exceeded the SSSL (0.00003 mg/L) at two sample locations (FTA-64-GP07 and FTA-64-GP14).

Semivolatile Organic Compounds. Three SVOCs, including di-n-butyl phthalate, diethyl phthalate, and phenol, were detected in groundwater samples collected at the DEH Compound, Parcels 64(7) and 1(7). The diethyl phthalate and phenol results were flagged with a "B" data qualifier, signifying that these compounds were also detected in an associated laboratory or field blank sample. SVOCs were not detected in eight of the samples. SVOC concentrations in the groundwater samples ranged from 0.001 mg/L to 0.011 mg/L, and the cumulative concentration was 0.062 mg/L.

The SVOC concentrations in groundwater were below SSSLs.

5.4 Surface Water Analytical Results

Six surface water samples were collected for chemical analyses at the DEH Compound, Parcels 64(7) and 1(7), at the locations shown on Figure 3-1. Analytical results were compared to recreational site user human health SSSLs, ESVs, and metals background concentrations, as presented in Table 5-4.

Metals. Fifteen metals were detected in surface water samples collected at the DEH Compound, Parcels 64(7) and 1(7). Beryllium (FTA-64-SW/SD01), copper (FTA-64-SW/SD02), mercury (FTA-64-SW/SD03), and vanadium (FTA-64-SW/SD01) were each detected in only one of the surface water samples. The beryllium, copper, and vanadium results were flagged with a “B” data qualifier, signifying that these metals were also detected in an associated laboratory or field blank sample.

The metals concentrations in surface water were below SSSLs. The concentrations of six metals (aluminum, barium, chromium, iron, lead, and mercury) exceeded ESVs. With the exception of chromium in one sample (FTA-64-SW/SD03), these metals concentrations were below their respective background concentration. A background concentration for mercury in surface water was not available (SAIC, 1998). The chromium concentration (0.0192 mg/L) exceeded the range of background (0.014 mg/L).

Volatile Organic Compounds. Acetone, cis-1,2-DCE, and methylene chloride were detected in surface water samples collected at the DEH Compound, Parcels 64(7) and 1(7). Methylene chloride (FTA-64-SW/SD03) and cis-1,2-DCE (FTA-64-SW/SD01) were each detected in only one of the samples. The methylene chloride result was flagged with a “B” data qualifier signifying that the compound was also detected in an associated laboratory or field blank sample.

The VOC concentrations in surface water were below SSSLs and ESVs.

Semivolatile Organic Compounds. Phenol and bis(2-ethylhexyl)phthalate and were detected in surface water samples collected at the DEH Compound, Parcels 64(7) and 1(7). The SVOC concentrations in surface water were below SSSLs. The concentration of bis(2-ethylhexyl)phthalate exceeded the ESV in four of the samples.

Pesticides. The pesticides 4,4’-DDD and 4,4’-DDT were detected in one of the surface water samples (FTA-64-SW/SD03) collected at the site. Pesticides were not detected in the other surface water samples.

The 4,4’DDT concentration (0.00096 mg/L) exceeded the SSSL (0.00067 mg/L) and ESV (0.000001 mg/L); the 4,4’-DDD concentration (0.000073 mg/L) exceeded the ESV (0.0000064 mg/L) but was below the SSSL (0.00132 mg/L).

Herbicides. The herbicide 2,2-dichloropropanoic acid was detected in one of the surface water samples (FTA-151-SW/SD03) collected at the site. Herbicides were not detected in the other surface water samples. The 2,2-dichloropropanoic acid concentration was below the SSSL (an ESV for 2,2-dichloropropanoic acid was not available).

5.5 Sediment Analytical Results

Six sediment samples were collected for chemical and physical analyses at the DEH Compound, Parcels 64(7) and 1(7). Sediment samples were collected from the upper 1 foot of sediment at the locations shown on Figure 3-1. Analytical results were compared to recreational site user human health SSSLs, ESVs, and metals background concentrations, as presented in Table 5-5.

Metals. Twenty-three metals were detected in sediment samples collected at the DEH Compound, Parcels 64(7) and 1(7). Antimony (FTA-64-SW/SD01), cadmium (FTA-64-SW/SD01), silver (FTA-64-SW/SD01), and thallium (FTA-64-SW/SD02) were each detected in only one of the samples. The thallium and sodium results were flagged with a "B" data qualifier, signifying that these metals were also detected in an associated laboratory or field blank sample. Sample location FTA-64-SW/SD01 contained each of the detected metals except thallium.

The metals concentrations in sediments were below SSSLs. The following metals concentrations exceeded ESVs and their respective background concentration: cadmium (one location), chromium (two locations), copper (six locations), lead (four locations), mercury (one location), nickel (one location), and zinc (one location). With the exception of the chromium (65.9 mg/kg and 112 mg/kg) and zinc (261 mg/kg) results, these metals concentrations were within the range of background values determined by SAIC (1998) (Appendix H).

Volatile Organic Compounds. Six VOCs, including 2-butanone, acetone, bromomethane, carbon disulfide, methylene chloride, and toluene, were detected in sediment samples collected at the DEH Compound, Parcels 64(7) and 1(7). The methylene chloride results were flagged with a "B" data qualifier, signifying that the compound was also detected in an associated laboratory or field blank sample. Sample location FTA-151-SW/SD01 contained five of the six detected VOCs. VOC concentrations in the sediment samples ranged from 0.0016 mg/kg to 0.083 mg/kg, and the cumulative concentration was 0.247 mg/kg.

The VOC concentrations in sediments were below SSSLs and ESVs.

Semivolatile Organic Compounds. Eighteen SVOCs, including fourteen PAH compounds and four non-PAH compounds, were detected in sediment samples collected at the DEH Compound, Parcels 64(7) and 1(7). Sample location FTA-64-SW/SD02 contained sixteen of the eighteen detected SVOCs. Bis(2-ethylhexyl)phthalate and di-n-butyl phthalate were the only detected SVOCs at four sample locations (FTA-64-SW/SD03, FTA-151-SW/SD01, FTA-151-SW/SD02, and FTA-151-SW/SD03). SVOC concentrations in the sediment samples ranged from 0.059 mg/kg to 2.0 mg/kg and the cumulative concentration was 13.1 mg/kg.

The SVOC concentrations in sediments were below SSSLs. The concentrations of nine SVOCs (PAH compounds) exceeded ESVs in one sample (FTA-64-SW/SD02). In addition, di-n-butyl phthalate concentrations exceeded the ESV at three additional sample locations.

Pesticides. Three pesticides (4,4'-DDD, 4,4'-dichlorodiphenyldichloroethene, and 4,4'-DDT) were detected in two of the sediment samples (FTA-64-SW/SD01 and FTA-64-SW/SD03) collected at the site. Pesticides were not detected in the other sediment samples.

Pesticide concentrations in the two sediment samples (FTA-64-SW/SD01 and FTA-64-SW/SD03) were below SSSLs but exceeded ESVs.

Total Organic Carbon. Six sediment samples were collected and analyzed for TOC content. TOC concentrations ranged from 1,160 mg/kg to 40,000 mg/kg in the six samples. The TOC results are summarized in Appendix E.

Grain Size. The results of grain size analysis for sediment samples are included in Appendix E.

6.0 Summary and Conclusions and Recommendations

IT, under contract with USACE, completed a SI at the DEH Compound, Parcels 64(7) and 1(7), at FTMC in Calhoun County, Alabama. The SI was conducted to determine whether chemical constituents are present at the site at concentrations that would present an unacceptable risk to human health or the environment. The SI at the DEH Compound, Parcels 64(7) and 1(7), consisted of a the sampling and analyses of eight surface soil samples, one depositional soil sample, fifteen subsurface soil samples, eighteen groundwater samples, and six surface water and sediment samples. In addition, fourteen temporary monitoring wells were installed in the residuum groundwater zone to facilitate groundwater sample collection and provide site-specific geological and hydrogeological characterization information.

Chemical analyses of samples collected at the DEH Compound, Parcels 64(7) and 1(7), indicate that metals, VOCs, SVOCs, pesticides/herbicides, and dioxins were detected in the various site media. Analytical results were compared to the human health SSSLs and ESVs for FTMC. The SSSLs and ESVs were developed by IT for human health and ecological risk evaluations as part of the ongoing SIs being performed under the BRAC Environmental Restoration Program at FTMC. Additionally, metal concentrations exceeding SSSLs and ESVs were compared to media-specific background screening values (SAIC, 1998), and SVOC concentrations exceeding SSSLs and ESVs in surface and depositional soils were compared to PAH background screening values (IT, 2000b).

The potential threat to human receptors is expected to be low. Although the site is projected for active recreational use, the soils and groundwater analytical data were screened against residential human health SSSLs to evaluate the site for possible unrestricted future land use.

In soils, with the exception of barium in one depositional soil sample, the metals concentrations that exceeded SSSLs were below their respective background concentration or within the range of background values determined by SAIC (1998). Three PAH compounds (benzo[a]pyrene, benzo[a]anthracene, and benzo[b]fluoranthene) were detected at one surface soil location (FTA-64-GP06) at concentrations exceeding SSSLs and PAH background values. However, these PAH compounds are believed to be related to anthropogenic activities (i.e., asphalt pavement) and not related to operations conducted at the site. The concentrations of two pesticides (4,4'-DDD [8.7 mg/kg] and 4,4'-DDT [7.7 mg/kg]) exceeded SSSLs at one surface soil location (FTA-64-GP15). Low levels of dioxins (0.0000003 mg/kg to 0.013 mg/kg) were detected in the two surface soil samples (FTA-64-GP01 and FTA-64-GP02) that were analyzed for these compounds. The concentrations of two dioxins (1,2,3,4,6,7,8-heptachlorodibenzo-p-dioxin and octachlorodibenzo-p-dioxin) exceeded SSSLs. Given the low concentrations and limited spatial distribution at the site, the pesticides and dioxins are not expected to pose a threat to human health.

In groundwater, several metals were detected at concentrations exceeding SSSLs and background concentrations. However, the majority of these metals were detected in groundwater samples with high turbidity at the time of sample collection, causing the elevated metals results. Vinyl chloride was detected in two groundwater samples (FTA-64-GP07 and FTA-64-GP14) at concentrations (0.00043 mg/L and 0.00016 mg/L) exceeding the SSSL (0.00003 mg/L). However, the vinyl chloride concentrations were below the EPA drinking water standard (0.002 mg/L), and vinyl chloride was not detected in any other wells at Parcel 64(7) or in surface water samples collected from Cane Creek, which is hydraulically downgradient of the wells with the vinyl chloride detections. The extent of the vinyl chloride contamination is defined horizontally and, given the low concentrations detected, is not expected to pose a threat to human health.

Metals, SVOCs, and pesticides were detected in site media at concentrations exceeding ESVs. However, the potential impact to ecological receptors is expected to be minimal based on existing habitat and site conditions. The site, located within the developed portion of the Main Post, consists of buildings and paved roads/areas interspersed with limited grassy and wooded areas. Viable ecological habitat is presently limited and is not expected to increase in the proposed land-use scenario. Consequently, the potential threat to ecological receptors is expected to be low.

Based on the results of the SI, past operations at the DEH Compound, Parcels 64(7) and 1(7), do not appear to have adversely impacted the environment. The metals and chemical constituents detected in site media do not pose an unacceptable risk to human health and the environment. Therefore, IT Corporation recommends “No Further Action” and unrestricted land reuse at the DEH Compound, Parcels 64(7) and 1(7).

7.0 References

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ATTACHMENT 1

LIST OF ABBREVIATIONS AND ACRONYMS

APPENDIX A

SAMPLE COLLECTION LOGS AND ANALYSIS REQUEST/CHAIN-OF-CUSTODY RECORDS

SAMPLE COLLECTION LOGS

ANALYSIS REQUEST/CHAIN-OF-CUSTODY RECORDS

APPENDIX B

BORING LOGS AND WELL CONSTRUCTION LOGS

BORING LOGS

WELL CONSTRUCTION LOGS

APPENDIX C

WELL DEVELOPMENT LOGS

APPENDIX D

SURVEY DATA

APPENDIX E

SUMMARY OF VALIDATED ANALYTICAL DATA

APPENDIX F

DATA VALIDATION SUMMARY REPORT

APPENDIX G

VARIANCES/NONCONFORMANCES

APPENDIX H

SUMMARY STATISTICS FOR BACKGROUND MEDIA, FORT McCLELLAN, ALABAMA

APPENDIX I

GROUNDWATER RESAMPLING RESULTS